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EDISON ELECTRIC INSTITUTE BULLETIN

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PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

March, 1950-1951

SOURCE AND DISPOSAL OF ENERGY—MONTH OF MARCH

	1951	1950	%
GENERATION* (Net)			
By Fuel Burning Plants	21,698,855,000	18,267,973,000	+18.8
By Water Power Plants	9,221,217,000	8,729,061,000	+ 5.6
Total Generation	**30,920,072,000**	**26,997,034,000**	**+14.5**
Add—Net Imports Over International Boundaries	165,235,000	120,806,000	+36.8
Less—Company Use	129,403,000	132,581,000	− 2.4
Less—Energy Used by Producer	673,880,000	571,169,000	+18.0
Net Energy for Distribution	**30,282,024,000**	**26,414,090,000**	**+14.6**
Losses and Unaccounted for	4,281,431,000	3,849,572,000	+11.2
Sales to Ultimate Customers	**26,000,593,000**	**22,564,518,000**	**+15.2**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of March 31st			
Residential or Domestic	37,880,498	36,013,124	+ 5.2
Rural (Distinct Rural Rates)	1,602,259	1,549,420	+ 3.4
Commercial or Industrial:			
Small Light and Power	5,440,096	5,349,415	+ 1.7
Large Light and Power	247,034	227,224	+ 8.7
Other Customers	157,824	150,005	+ 5.2
Total Ultimate Customers	**45,327,711**	**43,289,188**	**+ 4.7**
KILOWATTHOUR SALES—During Month of March			
Residential or Domestic	6,593,194,000	5,782,035,000	+14.0
Rural (Distinct Rural Rates)	545,699,000	492,970,000	+10.7
Commercial or Industrial:			
Small Light and Power	4,565,286,000	4,001,897,000	+14.1
Large Light and Power	12,772,036,000	10,830,013,000	+17.9
Street and Highway Lighting	278,739,000	249,630,000	+11.7
Other Public Authorities	654,218,000	595,928,000	+ 9.8
Railways and Railroads:			
Street and Interurban Railways	319,545,000	324,452,000	− 1.5
Electrified Steam Railroads	221,931,000	230,847,000	− 3.9
Interdepartmental	49,945,000	56,746,000	−12.0
Total to Ultimate Customers	**26,000,593,000**	**22,564,518,000**	**+15.2**
Revenue from Ultimate Customers	**$460,900,400**	**$414,263,200**	**+11.3**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 months ended March 31st			
Kilowatthours per Customer	1,879	1,727	+ 8.8
Average Annual Bill	$53.74	$50.60	+ 6.2
Revenue per Kilowatthour	2.86¢	2.93¢	− 2.4

* By Courtesy of the Federal Power Commission.

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 19 JUNE, 1951 No. 6

The Job Is the Thing

By Louis V. Sutton

President, Edison Electric Institute, and President, Carolina Power & Light Company

An address before the Thirtieth Annual Convention, Public Utilities Advertising Association, New York, May 17, 1951

I HAVE been looking forward to the opportunity of talking to this group of advertising, publicity, and public relations executives. It gives me the chance to commend you on the contributions your work has made to the advancement of the utility industry. It also gives me an opportunity to discuss with you the growing significance and responsibility of advertising in the future of our industry.

The members of your profession are among the most alert and aggressive workers in the American business community. In the utility field, you have developed in advertising publicity and in public relations a management tool of remarkable effectiveness.

Increased Sales

The progress of our electric industry since the end of World War II is a record for which electric company advertising men may confidently claim considerable credit—electricity sales have increased by 45 per cent in the five years since 1945; eleven million new customers have come on electric lines; annual revenue has increased 50 per cent to over $5 billion.

To handle this business, the industry has undertaken a gigantic expansion program, one which has increased electric generating capacity 37 per cent since the War. Such an expansion program, requiring the expenditure of some $15 billion in eight years for new construction, could scarcely have been attempted, if advertising, used as a sales tool, had not been skillfully employed to bring in load for the new installations, so that the new facilities would begin to pay their way as soon as possible. Nor would the American people have invested their money unless they had faith in our future.

As to the electric power situation throughout the country—there is, and will be, enough electric power for both defense and civilian needs, provided the industry is allowed to carry out its program for installation of new generating equipment approximately as planned, and provided new war loads are located with due regard for power reserves available and shortly becoming available. In most cases new generating capacity, if needed, could be installed about as fast as the average new industrial plant could be located, built, and put into full operation. The utility industry is in better position to meet the present emergency than it was in World War II.

What you have done would seem to any fair-minded person to have been a pretty competent and satisfying job. But it appears that we all live in a world in which even the best job is not good enough. On top of the responsibility for merchandising your product, which is the ordinary advertising job, you have another job which, in my opinion, far overshadows in urgency the normal sales task. It is one which is not easily measurable in dollars and cents of revenues and expenses. It is too big in its goal, too intangible in its operation for that, but the failure to do this job can mean a transfer of the electric utility industry from private investors to the Federal government.

That duty, of course, is enlisting the people's support in resisting the efforts to socialize the electric utility industry. This responsibility is so great that we must not view with complacency what we already have done—gratifying though it is. We must be impatient of any technique and of any approach except the most hard-hitting and effective.

We all know now that it is vitally necessary for our industry not only to maintain an adequate supply of dependable service at low cost, but also that its achievements be appreciated and its worth to our American system of economy be recognized by our customers, investors, employees, and the public. Therein lies security for our industry and, we believe, for all American free enterprise, because what we do in the front line against the philosophies of expropriation and confiscation will have profound effects on those enterprises not now even under attack.

Vital Assignment

To you, gentlemen, the utility industry naturally must entrust the most vital assignment in this campaign. You know, through the practice of your profession, how public confidence may be developed or injured, and because of this you should seek a major role as a sort of conscience to management. All of you know—though some executives still do not know—that the best advertising or public relations campaign ever devised cannot offset the effect of company policies which work in opposite directions. Actions speak louder than words—and a good public reputation, built painstakingly over the years, can be destroyed through carelessness on the part of the company or misunderstanding on the part of the public, misunderstanding which often results from indifference to the job of telling the truth or neglecting to tell it in understandable terms.

While the period of emergency, which is likely to grow more acute, will multi-

ply public relations problems, these problems are with us in peace and war and seem scarcely less pressing at one time than at another. Nevertheless, the standards of American utility service are so high that near-perfection in service is taken for granted and performance forgotten, and so the occasional mishap or unavoidable circumstance, aggravated by material and manpower shortages, is likely to be remembered.

The Test of Public Relations

The test of the merit of our public relations during this period will be found in how our customers remember the occasional inconvenience due to human errors or unavoidable situations arising from our operations. Will they remember them with an understanding of the problems we face and an appreciation of the tremendous job the utility is doing or with anger and a feeling that the utility is incompetent?

Is your community aware of your expansion program, of its magnitude, of its foresightedness, and of the fact that it is undertaken under the stimulus of the free enterprise system? Does it have any idea of the relative proportion of your revenue which goes for taxes, labor, and dividends? Does it incline to believe that government power projects always are economical and always for the public good, and does it believe that private power projects symbolize profit-gouging?

These would seem absurdly simple questions, were it not for the fact that the answers to them often are tragically against us.

Lessons in Publicity

While the theme of display advertising nominally dominates this convention, a number of you are publicity men, and some of you share the responsibilities of both advertising and publicity, as well as other phases of public relations. In my opinion, the utility industry can learn some lessons in publicity from the debate on public-private ownership. I believe I am correct in saying that government agencies do not employ display advertising, but according to the Hoover Commission report, agencies of the Federal government, to further their objects, mostly nationalizing business, spend in excess of 105 millions a year for their propaganda.

The electric utility industry is spending less than one-fourth that amount for advertising, publicity, and other forms of public information. Is this effort by government bureaus effective? I need only review the progress made by one single agency — the REA. Without spending one cent for direct advertising, REA, through consistent publicity on both the local and national level, has created the impression that it has built more lines to serve more farm customers than has the electric utility industry. The average person believes, furthermore, that most of the lines built by investor-owned utilities would not have been built had it not been for REA.

A considerable proportion of the people believe that the electric utility industry cannot provide the necessary capacity to implement the defense program and that the government should therefore construct generating plants. During World War II and again in the present emergency, there is the publicity trying to prove a present and future power shortage.

It is widely believed, too, that hydro-electric plants invariably are more practical than steam plants, that steam generating plants somehow are "synthetic" and costly, while hydro stations are the handmaidens of nature and therefore benevolent, in spite of the fact that it should seem obvious that a company would always use the most economical source of power at hand.

Without Benefit of Advertising

These impressions are strongly entrenched, and they have been created without benefit of a single line of newspaper advertising. It is my belief that our industry has not given the propaganda methods of public-ownership advocates the consideration they deserve and has not yet found an adequate match for them.

A good publicity program can be a valuable adjunct to the overall public relations program and often can fill out blind spots in our program, accomplishing results impossible to advertising as such. Such a program means more than the release of an occasional story. It requires a real knowledge of what is going on within the company and out in the territory, and it requires a sound working acquaintance with publishers and editors in your service area. When we complain that a certain paper never tells our side of the utility story, we might reflect how long it has been since one of our own staff has even talked to those producing that paper.

I do not have to tell you that the electric industry is a poor advertiser. I should better tell this to the top executives of your companies and I propose to do so at our annual meeting next month in Denver. Apparently we spent $16 million in 1950 in advertising (including all five media), our entire industry ranking behind such individual companies as Procter & Gamble, who spent $27 million, and General Foods, who spent $18½ million. Our industry's advertising program, ECAP, ranked 98 in the list of 100 leading national advertisers for 1950, as shown in the February 23 issue of *Printers' Ink*. The three top soap companies spent $52½ million in media and $77 million in total advertising, as against our industry's total $25 million.

Association Funds

We have in the electric industry four major industry associations: the Edison Electric Institute, Electric Companies Advertising Program, National Association of Electric Companies, and Public Information Program. They are all doing good work, but they are not supported by the industry as they should be. The EEI represents 80 to 85 per cent of our industry with total dues of around $800,000. ECAP has the support of 60 per cent of the industry with an income of $1,400,000. The NAEC has about two-thirds of the industry with an income of around $400,000, and PIP, which has only recently been organized by ten companies, now has 70 member companies with an income of about $300,000.

Pitifully Small Amount

This is a total of slightly less than $3,000,000. For the individual companies supporting all four, the cost is about one-tenth of 1 per cent of total gross revenues, or about 1 mill out of each dollar. For the industry as a whole, with gross revenues for 1950 of $4½ billion, excluding inter-company sales, the cost is two-thirds of a mill per dollar of gross revenue, or around six one-hundredths of 1 per cent. Now this is a pitifully small amount for our industry, which is fighting the battle of our own existence as well as our free private enterprise system.

The budgets of these four associations should be increased to at least $4 million a year with ECAP using half of it. I think you will agree with me

that ECAP has been most helpful in bringing about the encouraging recent survey of public opinion of our industry, which you have have recently listened to, and in our improved position with the public as compared with ten or even two years ago. The sentiment in favor of government ownership has declined. Criticism of company profits has declined. Socialism is an even more unfavorable symbol to the public today than it was two years ago. I am convinced the public will support the utility industry against unfair encroachment if we can give it the facts and the truth.

Our industry has done a wonderful job. Our engineering, development, and service rendered have been unsurpassed. We have financed and made available the necessary capital. Our sales promotion has been splendid. We have operated well and efficiently and are rendering a great service at low cost—a cost that has been decreasing over the years when the cost of all other commodities is increasing. We have a great story of accomplishment and service. But do the people know it?

In the face of the acknowledged need for a more aggressive and thorough public relations program, it is surprising to see how little effort we are making. It is true that the companies, in addition, have their own budgets for territorial advertising and public relations, but the combined budgets, local and national, are entirely inadequate to do the desired job. Your own 1949 utility analysis of public relations expenditures reported 82 cents per customer, or around 25 millions in 1949, this figure including public relations expenses as well as advertising itself. It is often difficult to see the definite and indisputable workings of your program, but it is easy to see the lack of such workings as we have seen it in the past and may see it in the future.

The record of utility progress itself is a tribute to your ability to arouse interest and understanding, and these same abilities are needed inside the industry. Yours is a mission which must be recognized throughout your company's organization. You must sell free enterprise to your customers, and at the same time sell your program of selling to management. It is a task you must accept and must accomplish. Already you have come a long way toward this accomplishment—more and more is

(*Continued on page* 197)

Národní Podnik

These words of warning, briefed here, were spoken to members of the 5:15 Club by Salesman Alexander A. Vervaert of the Electric Light Corp.

WE are a nation made up of individuals, each to his own extent adventuresome, hard-working, comfort-loving and sharing the common belief in the dignity of his fellow man. As such we earn our living and better our standards through a great American tradition, free enterprise.

The American way provides for free enterprise and free enterprise provides for the highest standard of living any people has ever enjoyed. Yet today, incredible as it may seem, some factions are waging a veritable "cold war" against the American way.

NÁRODNÍ PODNIK. This is a sign of the times. It is the sign of our decade and possibly of future civilizations. NÁRODNÍ PODNIK is the sign that today in some European and Asiatic countries identifies nine out of 10 shops, services and businesses. NÁRODNÍ PODNIK is the sign that replaces the owner's name over the door.

NÁRODNÍ PODNIK is a threat. It is a threat to Brown's Variety Store. It is a threat to McQuade's Clothing Store. It is a threat to the Boston & Maine Railroad. It is a threat to the New England Electric System. It's very unlikely that the sign over our door would read in the Russian, but be assured that the English translation would mean the same, for NÁRODNÍ PODNIK means *"National Ownership."*

In Czechoslovakia today, gone is the pride of the little shopkeeper. Gone is the better mousetrap maker. Gone is the pride of ownership and the quality product. Gone is the corporation made up of the savings of little stockholders.

Of course we find comfort in that we don't approve of Czechoslovakia. We frown on Czechoslovakia. Yet national ownership was forced on that country, while national ownership is finding ready and willing sympathy in America.

The biggest delusion we have is that we can nationalize up to a certain point and then stop. But national ownership is the result of Socialism whether it be the Nazi, Russian, British or Washington-on-the-Potomac brand of Socialism. The difference is in the approach. The ends are the same.

Socialism is the control of your economy and this is the first step toward the absolute control of your life.

Among Socialist measures introduced in the past few years, we can recognize efforts to socialize medicine, the levying of punitive taxes, the leveling of incomes, the holding of "Star Chamber" hearings, the growth of an inflationary public debt and the perverting of our elective government to a government by bureaus and directives.

Yet, this is not the work of the Socialists or Communists. We who on one hand vote against Socialism have allowed it to creep into our economy through our acceptance of the handout state. We have approved of the economic planners.

Instead of fighting Socialism as an all-out war, we've merely engaged it in petty skirmishes. When public utilities were first attacked, the doctors were unconcerned because socialized medicine was not yet a threat to their profession. While chain stores were being investigated, the small businessman thought his boom was due. While public utilities are on the griddle, preachers and teachers can't see any threat to their right to teach or preach.

We can find no solace in feeling that Socialism will never be. Even Hitler couldn't, t h r o u g h armed might, force his brand of Socialism on Great Britain, yet a few months after his total defeat that country was turned over to the Socialists, lock, stock and barrel.

The sign has been made up and is ready to hang at our door. NÁRODNÍ PODNIK is facing the public utilities, its greatest foe. Yet, by default, the utilities may well become its greatest victory.

From the May, 1951, issue of *Contact*, published by the New England Electric System.

Ceremonies Mark Southern California Edison's Millionth Meter Day

KEEPING pace with the rapid residential, commercial, and industrial expansion of the Southland area, Southern California Edison Co. celebrated the installation of its one-millionth meter in April.

The special gold-plated meter was personally installed by company President W. C. Mullendore at the home of Mr. and Mrs. Dale B. Lillywhite in the Friendly Hills section of Whittier, California.

Attending the ceremonies, in addition to Mr. Mullendore and Mr. and Mrs. Lillywhite, were Public Utility Commissioner Harold P. Huls, Mayor P. J. O'Melia of Whittier, company officers and executives, and managers of the thirty-two Edison districts in Central and Southern California.

Following the installation, Mr. and Mrs. Lillywhite were guests of honor at a luncheon, at which Mr. Huls and Mr. Mullendore were speakers.

Mr. Huls pointed out that as of April 1, 1950, the counties served by Southern California Edison had experienced a population increase of 50.2 per cent over the previous decade. He lauded the company for not only keeping abreast of the growth of population, commerce, industry, and agriculture in Southern California, but also for contributing substantially to the expanding economy of the productive region in which it operates.

The installation of the company's millionth meter, Mr. Huls continued, is of unusual significance, especially when one considers that Edison does not serve Los Angeles, Pasadena, Glendale, Burbank, and certain other cities in the various counties which comprise its operating territory.

President W. C. Mullendore (left) and Whittier District Manager W. L. Phillips inspect Southern California Edison's millionth meter.

Part of the Community Life

In discussing the nature of the company, its composition, and how it accomplishes the purposes for which it was created, President Mullendore said:

"To some people the Edison Company is the man who reads their meter, or who accepts their payments, or it may be the president, or our officers. Others may picture it as all of our properties. None of these is the Edison Company. Everyone who works with us represents our company, but no *one* man, no *one* group of men, whether all our customers, or employees, or stockholders, is the Edison Company. . . People are the vital element, however, and this includes *each one* of our customers, *each one* of our stockholders, and *each one* of us who work for Edison. Our company is the instrumentality, the agency through which during the years of its history there was organized the cooperative effort of hundreds of thousands of individuals who seek to provide for the needs of their friends and neighbors as well as their own. It did not spring into being overnight, but rather it grew as the needs of the people grew. Its growth has made it appear impersonal, but it exists solely through individuals—no less so than the day when all its officers, owners, employees, and customers combined, totaled less than thirty people.

"Our company has been a part of the community life of Southern California for so long that only a few hold the mistaken belief that it is something separate and apart from individuals— individuals who are vitally concerned with the development of Southern California. Most of us do not fall into the error of depriving individuals of their character as human beings because of such impersonal tags as "customers," "employees," "stockholders," "managers," or "directors." Those who are blinded by such tags, however, sometimes mistakenly think of our company as something which can be held up and praised, or slapped down and criticized without affecting human beings. But like other such agencies, beneath all the tags, the basic fact remains—the company means individual human beings joined in a common purpose. Each one of us is voluntarily engaged in cooperative effort—producing, distributing, and using electric energy. Our company is people furnishing themselves with the kind of service they have freely decided they want."

Illustrated programs and medals commemorating Millionth Meter Day were presented to guests, and the installation ceremonies were later telecast throughout Southern California over Station KTTV.

Dedication to Public Service

By Henry B. Bryans
President, Philadelphia Electric Company

An address under the Charles Day Lecture Foundation of The Franklin Institute of Philadelphia, given at the Institute, May 16, 1951

EACH year since 1944 a day has been set aside by The Franklin Institute to honor the memory of Charles Day who, in his time, was a devoted public servant, an engineer, a tactful, modest, and inspired leader in the world of large affairs.

Achievements

His talents were many. Foremost among his achievements was pioneer work in the field of scientific management. He developed a system of cost accounting which was adopted, in its essentials, by the electric utility industry. During the first World War, he served on a number of missions for the United States government. He was a member of the board of managers and for several years a vice president of the Franklin Institute.

Shortly before his death in 1931, Charles Day made a statement which typified his attitude throughout a brilliant and all-too-short career. "It is not the number of hours I have spent on this earth that matters," he said, "but only whether I have done my job."

Charles Day devoted many years of his life to the betterment of public service. He was eager to direct his talents and his professional skills to the solution of business problems of railroads and electric utilities. Many forward-looking contributions that he made to sound business management left indelible marks on our way of life. The solid foundation of the electric light and power industry is a testimonial to the way in which Charles Day and his pioneer contemporaries met challenges 20 and more years ago.

Birth of Public Service

In most fields of endeavor it is necessary to go back much farther than one or two score years to find "pioneers." But the electric industry is an exception. It is really not very old, as corporate life is measured; in fact, we might well say it is still a junior.

Less than seven decades have passed since the beginning of the electric utility business in the United States. Charles Day was a lad of three when Thomas A. Edison, in 1882, opened the first central station for the public sale of electricity—the little Pearl Street station in New York City. Water and gas services, railroads, the telegraph, and the telephone had already arrived.

As many in this room well know, the expansion of the electric utility industry to its present size and capabilities has not been a one-sided success story. There have been discouraging obstacles and pitfalls from the very outset.

The life of an industry is not unlike the life of an individual. Each passes through different phases—infancy, childhood, spirited youth, and mature vigor. Each has its own trials, troubles, and tribulations.

Benefited by Genius

In its infancy and childhood, the electric utilities had the benefit of the inventive genius and technical skills of men like Thomas A. Edison, Charles J. Brush, and Philadelphia's native sons, Elihu Thomson and Edwin J. Houston. The first dynamo tests ever made were carried out by this latter team in The Franklin Institute. Preceding these leaders by a full century was the man in whose memory this institution was founded, Benjamin Franklin, whose kite experiments in Philadelphia proved that lightning and man-made electricity are identical.

Great advances were made in the 1890's and early 1900's in the art of producing and distributing electricity. One of the greatest of these improvements was the substitution of the alternating current system of supply for the original direct current system.

The ever-present operating and engineering difficulties of those early days were further complicated by financing and organization problems. A little later came the need of a sound basis for utility regulation. These growing pains were not too serious, however, and they were absorbed by the lusty young giant without too much straining.

Applying Charles Day's test for a useful life on earth, I pose this question: How well has the electric utility industry done its job? Let us look at the record.

It is the duty and the responsibility of electric utilities to supply adequate and reliable light and power service; to meet the demands of all of the people, all of the time, at a fair price.

Meeting All Needs

Meeting all needs means satisfying not only the normal, year-in and year-out requirements of residential, business, and industrial customers, but also the soaring demands of war, as well as expanding needs during unforeseeable emergencies like the one that exists today.

To its great credit, the power industry is carrying the heavy load of the current defense effort without difficulty, even though these demands have been superimposed on a record-breaking peacetime consumption.

This performance fully matches the industry's fine job during the past war, when all needs were met adequately and on time. There is no higher tribute to this wartime performance than the statement made at the end of World War II by J. A. Krug, head of the Office of War Utilities and later Secretary of the Interior. "Electric power," he said, "has never been too little nor too late."

A Great Challenge

Notwithstanding such noteworthy performance, one of the greatest challenges that face the electric utility industry today, and over the long range, is the need to make customers aware of the fact that the tax-paying, business-managed electric light and power companies of this country are producing an abundant supply of low-cost electricity; that they are able to do so because they have brought into being the most efficiently-designed and the most economically-operated electric generating and distribution system in the world.

This enviable position reflects the exercise of private initiative, and the

application of unhampered energy, imagination, and inventive ability over the years. History shows there is no substitute for these ingredients of success, and that they flourish most effectively under free enterprise.

It is the duty of utility management to remind their customers at every opportunity of the benefits they receive through the electric utility industry; also to make clear to them that the public at large has a great stake in the preservation of the investor-owned electric light and power industry, which makes these benefits possible. Such a program will not only offset contrary claims, but it will overcome confused thinking which might otherwise lead to mistaken political decisions that would be contrary to the best interest of all.

Direct and Indirect Ownership

Direct ownership of the electric utility industry is now in the hands of about 3,000,000 stockholders. Indirect ownership touches some 80,000,000 life insurance policyholders. Doubtless a great majority of the latter individuals do not realize they have this stake in the business. One of the best things that could happen for the future of this country would be an even wider direct participation in the ownership of the electric light and power industry.

Many illustrations can be given of scientific management in action in the electric utility field. A good start would be to review the continuously increasing efficiencies which have been developed in the art of generating power.

Steam generation is the principal method used to produce electricity in America. This may not be realized by some, because of the wide publicity given water-power development in recent years. The fact of the matter is that hydro generation shows a slight decline, and today accounts for only 29 per cent of the total power generated in the United States.

Importance of Steam Generation

This does not mean that hydroelectric generating capacity is unimportant, but it does reflect the degree to which the nation's growing power demands are being met by steam-generating stations.

Fuels used to produce power in these steam plants are coal, oil, and gas. By far the most widely used is coal, which accounts for more than two-thirds of all fuel-produced electricity. Expanding power requirements have increased the use of coal many, many times. Yet, less coal per kilowatthour produced is required today than ever before.

Twenty years ago, the industry used 1½ pounds of coal to generate a kilowatthour. Twenty years before that, 4½ pounds were required. In 1892, the earliest year for which we have a record, it took 8 pounds of coal to produce one kilowatthour of electricity. Today, the national average is slightly less than 1¼ pounds. New generating units on order and being installed will be even more efficient, for they will use only about 2/3 of a pound of coal for each kilowatthour of electricity produced.

This economical use of fuel to produce power reflects the cooperative efforts of the utilities and the manufacturers of the equipment and the users of it to bring about the best results. The achievement highlights the efficiency of modern steam generating plants, and illustrates scientific management at its best. Not only have the utilities thus built up a high efficiency in fuel utilization, but in doing so they have contributed substantially to the conservation of one of the nation's most valuable natural resources.

Power Interchange

Another application of scientific management that has contributed greatly to the forward march of the electric utilities of the nation has been in the field of power interchange.

Much has been published in recent years about "grid" systems and "power pools" formed by Federal agencies. Yet the fact is that Philadelphia Electric Co., Pennsylvania Power and Light Co., and the Public Service Electric and Gas Co. formed the first major system of interconnection over a quarter of a century ago.

The private utilities were alert to the advantages of this plan and to the fact that pioneering led to a great expansion of inter-company power connection. Today, there are power pool areas in all sections of the country, extending even into Canada. More than 90 per cent of the nation's power generating capacity is interconnected in some degree, and it is the exception to find any electric light and power company that has not pooled its generating facilities with its neighbors, all in the interest of maintaining economical, adequate, and dependable service for customers.

The importance of these vast reservoirs of power is magnified by the ever-increasing demand for electricity. Since 1939, the last pre-war year, the use of electricity in the average home has more than doubled!

How does the average home manage to use twice as much electricity as in 1939? What is done with it? The size of the house has not doubled and there are still only three meals a day. Why, then, this large domestic use?

Aladdin's Genie

For the answer to these questions we need only look into the typical American home, from the electric laundry in the basement and the electric range and other equipment in the kitchen, to the television in the living room and the electric blanket in the bedroom. We find electric power serving the household in many different ways, like the slave who obeyed Aladdin's magic lamp.

The advantages of electricity likewise have been brought to the farmers. Today, 95 per cent of the farms in this country receive electric service, or have it available at the end of their lane.

As remarkable as the increase in residential and rural uses of electricity has been, the growth in the use of electric power in industry has been equally striking. For example, industrial use of electricity has more than doubled in the past ten years. This is significant when it is considered that the substitution of electricity for human effort has enabled workers to manufacture more products in greater variety, more quickly, and more economically.

One Sure Bargain

This reference to economics brings to mind the rising cost of living. This is a subject that is painfully familiar to all of us, particularly to the housewife, who has learned about it in her daily battle with the budget. To her, talk about a cost-of-living "index," or a "50-cent dollar" is a bit academic. She does know, however, that the higher prices she pays for the necessities of life are something to be considered. Actually, the latest official figure issued by the government shows that the cost of living today is 185 per cent of the pre-war average.

In view of these things, where can the housewife look for a bargain in living costs today? There is one sure place, and that is in her electric bill, where her 1951 devalued dollar is buying about

40 per cent more electricity than her 1939 dollar bought.

In America, the advantages of modern electric conveniences are not confined to any so-called well-to-do group, as is largely the case in many foreign countries, where electric service was developed and is operated under systems different from our own.

On the contrary, the modern miracles of radio, television, electric refrigeration, and many others created by remarkable electric appliances are the common-place comforts of the great mass of our citizens. In the Philadelphia area alone the benefits of television, one of the latest of these wonders, are enjoyed in thousands of homes.

World-Wide Statistics

These far-reaching uses of electricity in America are reflected in world-wide statistics. Records for 1949, the latest available, show that the United States, with less than 7 per cent of the world population, produced 42½ per cent of all electric power generated in the entire world! Soviet Russia, the runner-up, is credited with 9.7 per cent, United Kingdom and Canada together, 12.7 per cent. No other nation produced as much as 5 per cent.

What explanation can be given for this seeming paradox of an ever-expanding demand being served at progressively lower rates? Some suggest the influence of government power operations, which became especially active during the past two decades and have had widespread publicity. The fallacy of this explanation is that the average cost of electricity has been decreasing since the birth of the industry about seventy years ago.

Fifty Per Cent Decline in Twenty Years

Some give credit to the regulatory commissions. Careful supervision of rates by these bodies deserves much commendation. However, most of the commissions were established in comparatively recent years, while the steady drop in the cost of residential electricity has been going on since the earliest days. In 1882, when the first rate information was available, the average cost of electricity for residential use was 25 cents a kilowatthour. By 1900, it had dropped to 17 cents. By 1915, it was 8 cents. By 1930, it was 6 cents. Today, it is about 3 cents—a reduction of 50 per cent in the past twenty years.

There must be some logical explanation for this constant decline through two World Wars, a great depression, and well into the present inflation. The facts are that the progressively lower rates charged for electricity were produced by a combination of many factors. First and foremost were availability and reliability of the service at fair rates, without which there could not have been successful promotion or new appliance development. It was these things, working together, and integrated by scientific management, which induced more and more people over the years to use more and more electricity. The explanation is as simple as that.

This situation did not just happen. To gain the economic advantage of volume power production, the industry had to promote the use of electricity, at attractive rates, and be ready to supply the greater volume of business produced by these sales activities. In other words, it was necessary to organize to handle more business, and then to attract additional business so as to keep generating transmission and distribution equipment operating most effectively.

Cooperation and "Know-How"

This required an over-all sales activity that included not only the power companies' own organizations, but close cooperation with manufacturers, distributors, contractors, and dealers. Behind it all there had to be aggressive, imaginative supervision, technical "know-how," and ability to devise equipment and facilities which could extract the last drop of economic benefit from an expanding scale of operations. And there had to be scientific management not only to correlate these interlocking activities, but to anticipate the pace of revenue growth and to keep the incentive of lower rates active in promoting more sales.

Unless industry planning had been well organized in all of these respects, periods of stagnation might have developed in the United States, just as they developed elsewhere. There has never been a period of arrested growth in the history of the electric industry in the United States, except in the depression years of the early 1930's. Even then the declines were relatively slight. This is excellent evidence that the utilities were soundly conceived and have been and are efficiently operated.

I have dwelt at length on the industry's responsibilities to the public because this is a fundamental and most important phase of the business. However, the electric utility industry can continue to meet these responsibilities only so long as it can maintain satisfactory relationships with its employees and with its investors. Only by gauging its operations to pay a fair return to investors, and to provide good wages and good working conditions for employees can the industry continue to attract the kind of capital and skilled personnel needed to keep pace with the constantly-growing demands for its service.

Employee Relations

Relations with employees have been good. Utility employees, now numbering nearly 300,000, have steady, year-'round jobs, and over the past 12 years, their typical weekly wage has averaged from 18 to 33 per cent more than the wage level of employees in manufacturing. Other benefits have likewise kept pace.

In the realm of investor relations, the fact that the electric power business is dependent for its lifeblood, so to speak, on continued investor confidence, stands as a constant challenge to scientific management. A careful course must be charted and followed, because of the possibilities of encountering adverse factors, beyond utility control.

The capital investment in utility plant and equipment, equivalent, on the average, to four or five years' revenues, is in sharp contrast with capital requirements of manufacturing industries, as a group, where capital is turned over about once every 8½ months. The great need for capital in the electric utility business means that it is a "must" for electric light and power companies to enjoy high prestige with security owners and investors.

Investment Per Employee

The unusually large investment required for electric utility plant facilities and equipment represents a sizable sum for each worker. For the utilities of the country the investment is equivalent to more than $56,000 per employee, which is eight times the average investment per employee in the nation's manufacturing industries.

It is interesting to note here that General Motors Corp., last year, did half again as much business as all of the country's electric utilities, public and private put together, with an investment of only 1/20th of that required for electric utilities!

Everyone knows how rapidly construction costs have advanced since the war. Price increases of 100 to 200 per cent for material and labor are not uncommon. Despite these soaring costs, rising demands for power left utilities no alternative but to proceed with expansion programs.

In this emergency, they have carried on necessary construction work, and at a cost per unit of capacity added which is closely comparable with the long-term trend. This is another achievement of the highest merit and not generally appreciated and understood.

Here, once again, scientific management was operating at its best, for it was this essential ingredient all along the line that produced the expert research, the improved designs, the careful planning, and the economical use of funds necessary to bring about so impressive a result.

A distinguishing characteristic of the electric utility industry has been its ability to accept criticism, to correct mistakes. Most of those present tonight remember the stormy times of the mid-thirties, when Congress passed the Public Utility Holding Company Act of 1935. It is human to recall only the abuses and consequent resentment which inspired the passage of this act. Yet the holding company had its advantages, particularly in the early days of the industry, when operating companies were small and struggling. As a result, such companies often lacked public confidence and the benefit of broad scientific approach by management. It was only natural that many of them found it difficult to get necessary things done through their own efforts, and especially to arrange adequate financing. It was in these situations that the holding company was especially helpful.

The corporate integration policy followed by electric operating companies in recent years has been productive of much good. The latest opinion polls show electric utilities today stand higher in the eyes of the public they serve than ever before. They have come a long way to win this confidence, and have earned it by the job they have done and are doing; and they are organized to continue to do this job in the future.

All of this points to mutual satisfaction and lasting friendship among customers, employees, and investors in the electric industry in the years ahead. Moreover, it supports the right of business-managed, tax-paying electric light and power companies to conduct the information program I mentioned earlier, and to speak out against the unfair competition from socialized and subsidized government ventures in public power.

Government power, under a system of tax-exempt, interest-free financing, and other unjust preferences and subsidies at the expense of all tax-payers, today constitutes about one-fifth of the nation's capacity. Twenty years ago only 6 per cent of the nation's power was produced by the government. Sooner or later the American people must consider, squarely on its merits, the question of how far this eroding tide of socialism will be permitted to go.

Summing up, may I suggest that the performance of the industry's job be appraised against its three-fold obligations: to the consumer public, to the investors whose money it uses, and to its employees. All are of equal importance.

This three-fold obligation presents a never-ending challenge to the industry's resourcefulness and ingenuity. It calls for constant exercise of scientific management, skill, and alert business judgment. But most of all, it calls for a spirit of dedication to the ideals of public service over and above the call of duty in the average non-utility commercial enterprise.

Those who have lived their lives in the electric utility industry know they are expected to give up some things which are the normal rights of others in unregulated business. This is the principle one of our military leaders had in mind when he declared recently that "there are certain inhibitions you accept when you put on a uniform." We know, for example, our company earnings will be restricted by law. We know we must conduct our affairs in a goldfish bowl of regulatory supervision. We know we cannot pick our customers. As soldiers of public service, we are always on call, and we are expected to deliver service day and night, rain or shine, Sundays and holidays, notwithstanding hurricanes, or disasters, or personal danger.

In the years ahead, I foresee that the work of the electric industry will be regarded as a profession. The difference between a profession and any other business vocation is not only specialized knowledge, but also a special sense of duty. The professional man feels indebted to his profession. Regardless of his own personal fortunes, he strives to be a credit to his profession and to keep faith with those who preceded him.

The electric utility industry has such a heritage, which has been handed down from the founding fathers of Edison's day. It has been upheld since then by those who have been busy with technical research and improvements, with promotion and expansion of operations, and with winning the public confidence and the just recognition which this great industry deserves.

In the memory of Charles Day, who had an important part in these developments, I salute them all! May we, who carry on, deserve the mantle of responsibility which has been passed on to us!

Morris Tracy

MORRIS TRACY, senior assistant controller of the Niagara Mohawk Power Corp., died suddenly at McMinnville, near Portland, Ore., on May 20, while on a motor trip.

Mr. Tracy had been associated with Niagara Mohawk and its predecessor companies since 1934 and was widely known throughout the utility industry, with which he had spent all his working life. He was born in Penn Yan, N. Y., in 1886, and was graduated from Cornell University with a degree in mechanical engineering in 1909. He immediately entered the utility business and until 1918 was associated with William T. Morris of Penn Yan, owner of a number of gas and electric companies.

In 1918, Mr. Tracy joined the Empire Gas and Electric Co. at Geneva as an auditor and continued there until 1930, when he moved to Ithaca as head of the system and methods department of the Associated Gas and Electric Co.

He came to Syracuse in 1934 as treasurer of the 12 companies which in 1937 were consolidated into the Central New York Power Corp. Upon consolidation, he was elected a director, vice president, and treasurer of the company and was made an assistant controller of Niagara Hudson Power Corp., the parent company. When Niagara Mohawk was formed in January, 1950, Mr. Tracy was named senior assistant controller.

Other offices held by Mr. Tracy included positions as director and treasurer of Northern Development Corp., Frontier Corp., The Oswego Canal Co., and Old Forge Electric Corp.

The Engineer, the Machine Age, and the World of Tomorrow

By Philip Sporn

President, American Gas and Electric Company

An address delivered at the Engineering Conference, Virginia Polytechnic Institute

IT is commonly accepted that the industrial revolution was initiated in England and that it began roughly with the development of Newcomen's engine of 1705 and more definitely with the improvements made by Watt about 1774. At first this made it possible to do away with human labor for such backbreaking tasks as pumping and hauling. Then came the mechanization of scores of industrial activities: spinning, weaving, fabricating, and many others. And, because the power for these industries had to be developed in large units, the development of the engine eventually led to centralized industrial operations and to the subdivision of these operations, to large centers of activity and to concentration of population at these centers, with some good and many evil consequences.

But no such recognition has yet been given to the new industrial revolution which was made in the United States of America. This revolution is characterized by machine production, intense technological development, intense specialization, and a much higher rate of production per unit of human effort, that is to say, a great increase in productivity. It has been accompanied by and has enormously stimulated the spreading out of industry beyond the large centers.

The development of electric power and its universal availability throughout the United States has been an important factor in this revolution. And an even more important factor has been the relatively negligible cost of the mechanical energy that electric power has placed at the beck and call of every worker in industry to lift and haul, cut and chip, hammer and weld, spin and weave, transform and refine, and to carry out the myriad operations in producing the profusion of goods and services available today.

As a direct consequence of this new industrial revolution, we have a standard of welfare unequaled in history.

Let us look at what has happened here in the United States over the past 25 years. In a small table I have compressed into four groups, A to D, a number of indicators of the change in the standard of living during this period. In Group A I have placed two fundamentals—life span and health care. Group B, covering the next four items, shows the data on national income, wages earned, hours worked, and the consumers' price index. Group C includes three typical items commonly thought to represent amenities of living —passenger car registrations, telephones, and radio sets in use. And finally, in Group D I have given data on two of the fundamental factors upon which the others, more immediately representative of the standard of living, are dependent: electric power production and steel production.

These indicators reflect a most remarkable achievement in the history of the advancement of human welfare. Who can fail to be impressed by the fact that in the quarter century, 1925-1949, average life expectancy increased 13 per cent and average weekly wages went up 125 per cent, while weekly hours went down 12 per cent? Or by the striking increase of 211 per cent and 33 per cent in per capita production of electric energy and steel—both of basic importance?

And yet, remarkable as this accomplishment is, there certainly can be no question that all is not well with us as individuals or as a nation, nor with the world as a whole. Among individuals, even in this country, there is no general happiness; in the nation there is no pervading, satisfying, and strength-giving pride of achievement with confident hope for the future; and abroad there is no peace, in many quarters almost no hope. Some would go so far as to say that no hope is being held out for the Western

SOME INDICATORS OF THE CHANGE IN STANDARD OF LIVING IN THE UNITED STATES, 1925-1949

Group A	*1925*	*1949*	*Per Cent Change*
Average Male Life Expectancy at Birth in Year Indicated	57.8 Yrs.	65.4 Yrs.	+ 13.1
Hospital Beds per 1000 Population	6.9	9.9 ('47)	+ 43.5
Group B			
National Income (Billions)	$76.0	$221.5	+ 192.0
Average Weekly Wages, Manufacturing Production Workers	$24.37	$54.94	+ 125.0
Average Weekly Hours, Manufacturing Production Workers	44.5	39.2	— 11.9
Consumers Price Index (1935-1939=100)	125.4	169.1	+ 34.9
Group C			
Passenger Car Registrations	17,439,701	35,904,770	+ 106.0
No. of Telephones (Total U. S.)	16,935,918	40,709,398	+ 140.0
No. of Completed Calls Per Capita	194.9	355.4	+ 82.5
No. of Radio Sets in Use in U. S.	4,000,000	81,000,000	+1,950.
Group D			
Total Electric Power Production (Billions of Kwhrs)	84.7	344.5	+ 307.0
Total Electric Power Production (Kwhrs Per Capita)	743	2,310	+ 211.0
Steel Production (Short Tons)	45,393,524	77,978,176	+ 71.8
Steel Production (Tons Per Capita)	.391	.521	+ 33.3

system of civilization—for all of Western man.

How are we to work our way out of the deep morass we seem to have gotten into? How are we to bring under control the forces we have let loose? If it is a fact that our difficulties lie in the failure of our economic, social, and moral ideas to keep pace with the growth of technology, can we find our way back by declaring a moratorium on scientific and technological research and development? That has been suggested. Perhaps, it has been said, we can retrace our steps and set up islands of primitive simplicity and self-sufficiency. Is that the answer? Or is the answer an escape into other-worldliness and the pursuit of a course that would, through a religious revivalism, lead to the replacement of our present civilization by a "World-wide and enduring reign of the Church Militant on Earth?" That has been proposed by Toynbee.

We Cannot Go Back

I must admit that I cannot see any salvation in a return to ancient ways. It seems to me that we cannot go back. If one examines figures of energy production for the civilized countries of the world, one finds startling discrepancies in individual use. Whereas, for example, the kilowatthours produced per capita of population are around 2500 in the United States, they are a pitiable 2 in Pakistan, 4 in China, and only 14 in India.

What does this mean? Just this: on the average each human being in a country as technologically advanced as the United States has at his call 2500 kilowatthours per year. In the less technologically developed countries the corresponding figure is not 1/20th of that value in some of the better cases, and as little as 1/100th in the worst. As a consequence, in those countries the human being is reduced to the role of an energy producer. But how can you reconcile man's humanity or his having been created in the image of God with the idea of valuing him and using him primarily as an energy producer? Keep in mind that the average healthy human being so used can at best produce one kilowatthour in the course of a 12-hour working day. No, it seems to me that a return to the path of pre-industrial development is not going to make things right. On the contrary, we must continue on the road along which we can lift heavy toil from the back of man.

Nor does the answer lie, it seems to me, in any religious revivalism. That does not mean a denial of the place religion and religious experience can occupy in the growth and enrichment of the human spirit. But I am convinced that such dislocations and maladjustments as we suffer from cannot be cured by neglecting them and going off into another sphere, by—to borrow an engineering term—mixing dimensions.

A Dynamic Concept

What, then, is the answer? Which direction can we travel? If we cannot go back to primitive simplicities and barbarities, and if we cannot escape into a world of other-worldliness, then there is only one route left: continuation along the same route we have been traveling, the route of industrialization and mass production. But, if we follow that course, will that not lead to disaster, some of it almost directly ahead? I am deeply convinced that need not be so. Certainly not, provided we utilize the needs and respect the limitations of human nature as they have developed since the dawn of history, and provided we take advantage of the possibilities of enlarging both raw material supply and production, and the improvements in social relationships as these have been elaborated and tested by human experience. If, in short, we bring to our side a dynamic concept of human capability, if we test it realistically as we go along, and if we carry it forward with faith in ourselves and in human progress and our ability to promote that progress.

Truly Revolutionary Ideas

In her book on the problem of survival facing the West, Barbara Ward observes that the ideas and aspirations of Western man are far from materialistic. They are, in fact, the most startlingly spiritual forces that have ever affected society. Starting with an essentially static world, there emerged some 3000 years ago new forces which wrought probably the most radical transformation of the human race since man became recognizable man. These are the Graeco-Judeo-Christian ideas which are the heritage and foundation of our modern Western civilization and in which the basic Greek contribution was rational vision and the Judeo-Christian contribution was moral vision. Out of these there grew man's desire to transform and his belief in his ability to realize that desire, his desire to create, and his desire to seize on natural circumstance and to change and mold it to the use of man. Looked at from this perspective, it is the ideas of our Western civilization which stand out as the truly revolutionary ideas of the world and these are the ideas which must be carried forth if salvation is to be brought to man.

Shall we, then, retrace our steps? Denounce the industrial revolution? Try to arrest the second industrial revolution which, in my view, has already been going on a long time? Some, like Norbert Wiener, think we are only heading into the second industrial revolution, but I like to think that it began some 25 years ago and what we are heading into now is merely its full development. This development is going to carry to much greater heights the present mass production techniques. Automatization, of which we have seen a good beginning, will, during this phase, be carried much further, aided by the use of such devices as the computing machine and the vacuum tube. We ought to encourage these trends and developments. At the same time, we need to give them leadership.

Securing Leadership

Where and how shall we get that leadership? It is not likely that we shall get it from those scientists and social scientists who use a secure position of authority in their own special sphere as a springboard for pronouncements about the world at large. Atomic energy has given us some good examples of this habit. Since Hiroshima there has been a great preoccupation with peacetime uses of nuclear energy and a vast amount of nonsense on the subject by specialists whose knowledge of the world was too limited to furnish them with a sufficiently broad perspective.

We are told by these authorities that if only man were perfect he could now realize all the benefits of an atomic cornucopia, do away with want and disease, and secure riches for all. Or again, that the world can be set free by the atom if only the world will first set both itself and the atom free. The use of atomic energy for bombs, we are warned, has been allowed to compromise the very necessary potentialities of the long-time use of atomic power to replace oil and coal, which it is said are

within centuries, if not decades, of exhaustion.

It is obvious that these views, taken from a variety of sources which should be responsible, have this unifying trait: they ascribe almost supernatural powers to atomic energy that simply are not there. Because, stripped of its nuclear physics or the complex chemistry of its separation, and even more of the rhapsodic worship it has inspired, plutonium, U235, or U233, if any of them find use in production of energy, will find application to replace conventional fuels. True, if we can only bring about the solutions of a number of very difficult engineering and economic problems, they may become most superior fuels. Highly concentrated—one pound being capable of developing heat equivalent to that of 1500 tons of bituminous coal—such fuel would be easily transportable. It thus holds out hope of becoming a universally available fuel, and, perhaps, a more economical fuel than coal, oil, or gas. The development of nuclear fuel may, therefore, bring lower-cost heat energy and particularly lower costs of generation of electric energy.

Sphere of Importance

Is that important? Yes, very. But only to the extent that lower-cost fuel is an important item in the cost of electric energy. That means, therefore, that it would be very important in such operations as producing aluminum, magnesium, chlorine or titanium, and of almost no direct importance in ordinary industrial operations or in household use. But this admitted importance is hardly such as to warrant an assignment to the development of atomic power of values as cosmic as those cited.

Admittedly, atomic energy lends itself to a certain amount of etherealization. In matters more familiar we should logically be more stable. But is there anything less realistic than the fetishism with which many have surrounded hydro-electric power and which is summed up in the remark of an otherwise responsible economist who asserts that steam-electric power is aristocratic while hydro-electric power is democratic!

The remarks of scientists and social scientists to which I have been referring suggest a rather serious lack of comprehension on their part of the material world of today. One would expect that the very particulars in which their understanding is most inadequate could best be supplied by the engineer. After all, he is the one who developed and applied the machine technology which is the Western world's most conspicuous characteristic. One wonders why he does not have a larger share in providing the leadership which that world so desperately needs. Actually, engineers are hardly represented at all in leading roles in public affairs.

Engineers in Public Life

The cabinet of the most powerful democratic nation does not include a single engineer. In the 81st Congress of the United States there were only seven engineers out of 432 members, while the legal profession, for example, furnished 259 men. There were only five engineers in the Senate, as contrasted with 66 lawyers. Or consider the sobering fact that among the commissioners of the three perhaps most important administrative bodies in the executive branch of the government—the Securities and Exchange Commission, the Federal Power Commission, and the Atomic Energy Commission—there is only one engineer, who serves on the Atomic Energy Commission.

I do not pretend to know what accounts for the engineer's aloofness from public activities. Perhaps it is simply that the environment of politics, in the best sense of the term, is too alien an atmosphere for one who has been taught to believe that the world is composed of solid facts, that its variables can be balanced by contingency factors and that any compromise is questionable. Whatever the ultimate cause, it seems to me that engineering is not widely represented in public affairs because engineers, consciously or unconsciously, have elected not to make the effort necessary to become involved. This condition ought to be corrected if, as I believe, the engineer has been and is the instrument through which the second industrial revolution is being accomplished.

Whose Responsibility

Broadly speaking, responsibility for this inertia of engineers in public affairs rests with the present generation of practising engineers. In saying this, I mean that in the final analysis it is they who must be held responsible for the condition of our technical schools. They are the ones who propagate the new generation, and they propagate in their own image. What are they setting up as their image? In general, the definitions of engineering adopted by engineers stress the technical aspects of the field, and frequently along quite a narrow beam. The engineer thus restricts himself to the cramped role of technician. He does not even allow himself the breadth of field that goes with the concept of technologist.

Where does this narrowness of view and aim start? At least as far back as the beginning of the future engineer's technical education. It may well go farther back and have its beginnings in the preparatory or high school. It may very well be that here is molded in almost permanent form the ideas that engineering consists solely of the application of science to the design, construction and operation of machines and equipment or to the carrying on of processes "for the aid and convenience of men"; that those studies and interests which contribute directly to these stated aims are proper and should be encouraged; and that other studies and interests are not only divagational but are somehow soft and inconsistent with such an obviously manly profession as engineering.

Curricular Changes

If that is so, then as far back as the upper levels of our preparatory schools it is necessary to introduce curricular changes which will emphasize the potential breadth of engineering and the engineer's role, and stress the socio-economic usefulness and importance of technologists in modern society. The future engineer must be made to see not only that he will join a profession of technologists, but also that he should become an influential member of the much broader group who, together, are the architects of social progress, a circumstance that gives them boundless opportunities.

Equally important, we must make it clear that the very magnitude of the potentialities imposes heavy responsibilities on those who, as educators, undertake the task of molding and guiding the development of our future engineers. For it is the teachers in the preparatory schools who can best plant the idea that the role of the engineer is fully consistent with knowledge and understanding of the social sciences and the arts. As a matter of fact, I think the case warrants much stronger statement. A thorough grounding in the humanistic disciplines is indispensable to the engineer's full development and to his assuming any real leadership in the world of today.

The place to begin on this new road is the secondary school, but that is only

spadework. The real work must be done in the engineering college or technological institute. And this will be impossible unless we recognize squarely that by and large our engineering education has tended altogether too heavily toward the vocational. The curricula in the schools that propose to train engineers in the fullest sense must be broadened; more time should be devoted to social sciences and humanities. This may mean a reduction in time devoted to the specific engineering subjects—the subjects which are supposed to impart practical know-how. But if a choice has to be made between this know-how and the acquisition of a broadly based knowledge of society, past and present, the answer should not be difficult. Not know-how, but an understanding of the process for acquiring know-how and how to use know-how is what we have to aim at.

Too Many Facts, Too Little Thought

The last, it seems to me, is of particular importance. There is a general feeling, certainly prevalent in the United States, that we have in the past absorbed too many facts and thought about them too little; this applies with particular pointedness to engineers and engineering education. A great Polish scholar and philosopher who lived and taught among us for many years first pointed out some 30 years ago that the essential characteristic that differentiates man from plant and animal life was that, whereas plants possess chemistry-binding abilities and animals space-binding qualities, man is the only creature on earth who possesses the unique capacity to accumulate knowledge.

Over-Idealization

The engineer trained in science and engineering is apt to over-idealize this time-binding characteristic of his profession. For there also exists in human experience much knowledge that is non-cumulative, in the sense that the engineer's analytical methods and procedures, equations, formulae, and tables are completely cumulative. The knowledge relating to literature, philosophy, music, and art is of a quite different and infinitely less palpable kind. The broadening experience of these, no less than strictly technical study, is needed by engineers who want to assume a part in leadership in the world of tomorrow.

A significant step in expanding the scope of engineering education has been taken within the past year. Several of our leading universities had already demonstrated that the integration of technical schools within the university community, and the resultant close association between technology and the liberal arts, can do much to increase the effectiveness and vitality of all concerned. The new step is an extension of this idea. For the first time a technological university has organized a truly strong program in the liberal arts. I refer to the new School of Humanities and Social Studies at the Massachusetts Institute of Technology, one of the world's great institutions of engineering education. This school was not established with the idea of providing another institution where men could be trained primarily in the liberal arts. The idea was to enable the Institute to broaden and deepen its activities in these fields and to educate men to be effective citizens as well as effective professional engineers—to be, in other words, technologists and engineers and not mere technicians.

The mechanism for gaining this objective need not necessarily be the same in other engineering institutions, but the basic idea needs to be developed and implemented by many more schools. I haven't any doubt that only after this is done will we succeed in establishing a satisfactorily broad foundation for training the better-rounded engineers that the future demands.

Closer Integration

Nor can any program for enlarging the scope and vision of our engineers stop with the schools. The present generation of mature and successful engineers has a responsibility in this process also. This involves the closer integration of the engineers with one another and with the professional schools and colleges: each with his own alma mater, most naturally, but also with the other institutions that his work and practice naturally bring him in contact with. So many engineers of outstanding ability, upon reaching maturity, rush headlong along a road that will keep them as far away from engineering as possible. In doing that, they separate themselves from engineering and engineers, and also from their problems and the institutions where these problems are being worked on. While many of the engineers in this group would be emphatic in their denials of any such intent, they nevertheless generally imply that the profession and practice of engineering is not quite a satisfying occupation, although it may be an excellent stepping stone to some "higher" or at least more "responsible" form of activity.

This, it seems to me, is a great pity, because I believe that out of such judgment and action the engineers who have advanced in their profession not only lose an opportunity for spiritual expansion and satisfaction, but—and this is when the common welfare suffers—they fail to give the younger generation of engineers what they might otherwise be able to transmit of their own growth and development.

Dynamism of Engineering

Such men cannot only teach and contribute by precept and example but also have an opportunity to propagate one of the most important ideas that needs to be implanted in the minds of the young and younger engineers—the dynamism of engineering. The tendency toward overawing the young engineer with the vast amount of accumulated knowledge that he has to acquire in turn tends to sterilize his creative faculties before they have had an opportunity to blossom. It is the older generation of engineers who can furnish out of their experience the necessary distillate to avoid such deadly thinking and to establish the vitally important truth that what an engineer learns in his years at school and in his early years of practice about what others have done before him is but a prelude to what can be done and what is open and possible for him to do as he matures in his profession.

The Qualities of Leadership

It is the engineer educated in the basic sciences, the humanities, and the social sciences, and thoroughly grounded in engineering principles and ideas, who will find opportunities for constructive leadership. The engineer who is equipped initially with enough tools to begin working in his profession but who more and more relies on new ones that he requires as he goes along—he is the engineer who can stay buoyed up by the spirit of growth and progress and who can imbue others with this spirit. It is this engineer, with his knowledge of the machines that characterize and make possible the world of today, who can not only help create the world of tomorrow but who, taking his proper place in public affairs, will also help run it for the physical benefit and spiritual advancement of man.

The Market Approach to Community Development

By A. C. Spurr
President, Monongahela Power Company

An address before the Rural and Urban Development Conference, Philadelphia, Pa., May 15-16, 1951

"MARKET approach," as I interpret the term, is merely doing the job that is natural to the market you serve. It is the emphasis that community activity requires. In Crossroads, W. Va., the emphasis might be on better management of a dairy herd. In Chicago it might be on a problem of urban redevelopment.

Doing What Comes Naturally

It's all a case of doing what comes naturally. If there is a will to do a job it doesn't matter whether it's an agricultural problem, slum clearance or school improvement. For anyone, or any company that cares to *look*, there are always jobs that need doing and which will help to improve the community.

When I went with Monongahela, farm problems were foreign subjects to me, and I must admit that after 15 years of treating those problems, I still do my farming from the fourth floor of a downtown office building. I had learned long before, however, that a utility, because it is so closely identified with community life, has a direct stake in community problems, whether it be in a rural area or in the metropolis.

As far back as 1922 I came face to face with this principle in no less a great city than Pittsburgh. That year I was loaned by the Philadelphia Co. to a promotional housing corporation, operating under the flag of the Chamber of Commerce but with strong backing of the Duquesne Light Co. The objective was expansion of low and middle class housing.

The utility interest then was obvious, just as it was a bit later when my services were transferred to a city planning organization, also in Pittsburgh. Duquesne, Equitable Gas, and Pittsburgh Railways, subsidies of the Philadelphia Co., were very directly interested in the treatment of blighted areas and the movement of population. It was going to be their job to serve the utility needs of the area and the people in it.

I mention this to get across the idea that this thing of a utility company being interested in community affairs is nothing new; neither was it exactly new in 1922. I can say this about today and about 1922—there was not enough widespread realization of the utility's responsibility.

In 1925, when I transferred to Wheeling to work for the street railway company, the same lesson was driven home again. Wheeling in those days had been a busy, prosperous city but at the time was suffering from the aftermath of the 1922 depression. We were into franchise fights up to our neck. Spirits were low, nerves were frayed, and the railway company's relations with the community were far from being amiable. Taking a leaf from my experiences in Pittsburgh, we started out to identify the company as a part of the community, and before long we were in every neighborhood organization or movement that offered an opportunity to advance such identity. The plan worked. Soon we were back in the good graces of the people of Wheeling, and I feel that the company was able to contribute something to its economic and social revival. I even found myself cast in the role of being one of the founding fathers of Oglebay Park, a cultural-recreational project that has since gained national recognition.

Observation and Imagination

Whether it is Pittsburgh, or Wheeling, or Philadelphia or Chicago, the opportunity for service is there for those who wish to find it. It just takes a little looking around and some imagination.

Out in St. Louis they are wrestling with the problem of slum clearance, and I can assure you this is a problem we can expect to grow progressively worse in every city, unless we take steps to treat it. It is a growing problem because of a comparatively new trend in cities. There was a time when every city centered on its downtown business district—the place where the big office buildings, the shops, and department stores were located.

Today the trend is toward the city limits. There is only one direction in which residential building can move. That is to the outskirts or the suburbs, and business is following it. The trend toward neighborhood stores, neighborhood theaters, and neighborhood banks is well known to most of you here. The idea is permeating even into the ranks of the office dwellers. Why fight traffic congestion when we can move out to a spot where there is plenty of parking space, a bit of fresh air, and less noise and companion disturbances of downtown living? Connecticut Light and Power is moving out of Hartford to the country, not because of downtown conditions but to secure a location that is more central to its properties.

An Accumulation of Villages

Actually, we are moving toward a condition in which all of us can start thinking about the rural community, because that is exactly what the big city is progressing into—a sprawling accumulation of villages in which city workers sleep, play, and raise small vegetable gardens.

What about the old downtown business section? I'm not here to give you the answers. But there, certainly, is a problem that needs treatment. Are we going to let downtown become a ghost town?

The Union Electric Co. happens to be an organization that recognizes its heavy investment in St. Louis, and the fact that it can't make money in a slum section. The company is a part of the St. Louis Urban Redevelopment Corporation, an organization supported by subscription of leading newspapers, banks, department stores, manufacturers, and merchants of the city.

It took a kitty of about $2 million to start the St. Louis redevelopment program, and the corporation has authority

to issue negotiable income debentures in the principal sum of $5 million. Its stated purpose is the clearance, replanning, reconstruction or rehabilitation of blighted areas, and the construction of such industrial, residential or public structures as may be appropriate, including provisions for incidental recreational and other facilities.

Although the slum clearance program of the Federal Government is evident in St. Louis, the business and industrial interests of the city, Union Electric among them, were quick to see that the responsibility was primarily local. If it was to be far reaching and provide permanent treatment designed to St. Louis needs, the people of St. Louis, and the financial capital of St. Louis had to provide the leadership for the program. Treatment by the Federal Government alone was not the answer.

Union Electric, in order to invest in the redevelopment corporation, had to get permission of the SEC. In stating its case, the company declared that its participation in the program is not only in harmony with its civic responsibility but "that the carrying out of the objectives of the corporation will be in the best interests of the business section of the city and will thus redound to the benefit of the company and its service to the public."

St. Louis' problem is not unique. You have somewhat the same problem here in Philadelphia, between 10th and the river, and in Washington there's the area around the Capitol, with which many of you are familiar. I've used St. Louis only as an example. What they're doing may not fit your market at all.

Play by Ear

That brings us back to the market approach. Every market area has its own individual set of characteristics and ground rules for procedure. You sort of play by ear: get acquainted with the over-all problem, piece together the right pattern of things you can do to help, and then use your imagination.

It isn't just a case of maintaining our public relations. Most utility companies are reasonably well-liked at home by their customers, and most of them are doing the things expected of them as citizens. It takes more than that, however, if we are to protect our plant account and make sure that our service areas grow and prosper, carrying us along with them. The people who make up our communities are our bread and butter. Their prosperity measures our growth; their happiness measures the enjoyment we will get from serving them; their security is our security.

For us, there is something tangible at which to shoot, the profit motive, calling a spade by its right name. We have such a motive, not only in the growth that we can help develop but also in the service that we can render to the preservation of the American system of free enterprise. Business and industry have a clear-cut responsibility to that system, and the only sound way to preserve it is to make it operate in the best interests of everyone. We are doing that when we encourage and help communities to do things for themselves. When there is occasion for them to sit back and depend on government to do things for them, then our system is breaking down and the Socialists are taking over.

Water Conservation

I am going back for a minute to a common problem that some of you may consider rural, but which is actually more important to the metropolitan area than it is to the farmer. That is conservation, particularly water conservation. We'll skip the relationship of soil conservation to the food supply and the resources, such as timber, upon which Big Town depends. Water is something that hits closer home, because there isn't a metropolitan area in the nation today that can say it doesn't have a water problem. Water, or rather, a lack of water, is a very distinct threat to the future growth of the large urban area.

Rainfall doesn't change from year to year, but our facilities for storing rain water are changing—for the worse. It is running off, faster and faster, because we're taking away the trees, plants, and soil that used to hold it in the ground. And while that is happening, look how we are consuming water. In the past six years, water consumption in Baltimore has increased 69 per cent, against a population gain of only 6 per cent. In Philadelphia, the average individual now uses 168 gallons of water per day. I was interested recently to read that it takes 65,000 gallons of water to make one ton of steel. So it goes. At least the farmer, once his farm is worn out, can move away, but the electric company can't pick up its lines and poles and do likewise quite as easily. Then there are floods. The effect on your physical properties is not nearly as much as the justification that floods provide for the government to step in and build expensive flood control dams, which incidently can generate power. Instead of that kind of flood control, we need to be doing something about flood prevention, and the answer to that is conservation practices. Again, there is the answer to your problem of water supply: practices back in the hills that will hold the rain where it falls.

Here in the Philadelphia area we are getting a good example of how this problem can be approached. Incodel (the Interstate Commission on the Delaware) is a fine organization and can contribute importantly to improvement of the water supply situation. It is shooting at development of the entire Delaware River watershed. In Cleveland the groundwork is being laid for a Cuyahoga Conservancy District. Probably the best example of this approach that we have on record is the Muskingum Conservancy District in Ohio. In West Virginia we are talking about the same sort of thing for our watersheds.

What is this watershed development to which I refer? It is control of water flow, conservation of water resources, elimination of stream pollution, flood prevention, recreational development, and preservation of wild life. We might say it is the TVA idea without the power dams, without the unnecessary flooding of millions of dollars worth of valuable land, without the regimented shifting of population, without the expense of developing uneconomic water transportation facilities, and certainly without the centralized control that Washington exercises over the TVA. It is the sort of thing that the electric utility can get into and help put across, in its own interests as much as in the public's interests.

No Set Formula

As I have mentioned, there is no set formula for electric company participation in community development. You find out what needs to be done; then you figure out where your company fits into the picture.

If you will permit a bit of advice gained through experience, any company's participation in development programs should first of all be understood by those directly concerned—employees, stockholders, directors, customers and the public.

Pick your project, get expert advice on what needs to be done, and then go to work. In any project you decide to tackle, you can always find someone who can draw up the blueprints; and, as it

progresses, you will find more and more ways in which you can help.

Most of you know John Jones. John is on Monongahela's payroll because he has had broad training in city planning. We felt that if we were to get into that sort of thing, we should have a man who knew the technical phases of city planning. And through John we have the benefit of information and services made available by the technical planning groups in which we hold membership and in which John represents us.

Community Participation

Keep in mind that a community project must be just that—a community project. You can't break in and say "this is our project—this is how it will be handled," or "here's how our experts say it should be done." Community development doesn't work that way. You have to put a sales front on community participation. The biggest headache in any community effort is getting leaders and workers. As so many of you know, the tasks usually fall into the lap of a small group of people, and each time it is the same people. Let one company dominate a program and you drive away those who might otherwise help with it. It's a natural tendency to let someone else do the work.

The best results can be obtained if you can put across the selfish motive angle. There are others who stand to profit, the same as you. Write it out in dollars and cents, and the chances are you will find some recruits. Not to be overlooked in this connection are your own employees. If you can do the right kind of a selling job with them—show them why your company has a direct interest in community development and what it means to their job and their enjoyment of living—you will find that a lot of them will be valuable lieutenants, working with or as a part of the community organization that is to do the job.

Working Through Agencies

We have learned back home that if you go to the agencies of community development and demonstrate your sincerity to be a helper, you will get a lot of cooperation and a lot of results. In our agricultural activities, for instance, we work directly through the agencies involved. Agriculture Extension, Vo-Ag, the Conservation Commission, the farm men's and women's clubs—all of them have forgotten more about agriculture than we will ever know. They set the patterns, and we go along, helping where we can. The same is true in our dealings with Chambers of Commerce and other responsible civic organizations.

We have also found that one of the most effective groups to work with is the newspapers. Without their support, you're up against it—like that thing our industry is particularly conscious of today—talking to ourselves. We go to the papers right at the start, give them the story, and, I can assure you, we are never turned down. The newspapers are as much interested for selfish reasons as we are. Their life depends on area prosperity, too.

Does it pay off? That is the question your stockholders will ask. Development can run into big money, like the program that Union Electric is in. Well, Monongahela is just a small company, and we may be a made-to-order case, where we had everything to gain and nothing to lose. But, starting with V-J Day, we have been in a plant expansion program that by the end of next year will have increased our total plant value by 148 per cent! Not bad for country boys, and good for everybody in the community, and I can assure you we're not building on dreams.

Perhaps it is out of the province of this talk to discuss your committee. Certainly Elmer Lindseth defined your responsibilities in a clear-cut and decisive manner at your Cleveland conference. But I nevertheless want to add my voice to the others by saying that you have a most vital and important role to play in the electric utility industry.

This committee has great responsibility. Whether you know it or not, the work of this group as a vehicle for meeting and discussing the problems we all have at home can very largely determine the future course of serving this country with electricity.

Our responsibility goes much farther today than merely serving electric customers; farther, also than it went 30 years ago, when the industry recognized its responsibility to help shape the destinies of its communities.

Character Building

Just a few days ago, James Hillman, a prominent Pittsburgher who has been closely identified with that city's fine rebuilding program, made a very pertinent statement. He said: "Men around here, hard, tough industrialists, of whom you would never suspect it, came to realize that the carrying of a social or civic responsibility was not only broadening to them but did something—and I'm not kidding—to the spirit of this old place that was wholly surprising."

There is the whole thing in a nutshell. Through direct sales you build a reputation. Through indirect sales you build character. And, I might add in conclusion, in this day of expanding governmental services far beyond the old idea that government's job was only to govern, there is no limit to the character-building job we face.

Dr. John J. Wittmer

DR. JOHN J. WITTMER, vice president of Consolidated Edison Co. of New York, Inc., an authority in the field of industrial medicine, died on May 19. Dr. Wittmer had been with the Consolidated Edison system since 1924, when he joined the Brooklyn Edison Co. as a staff physician. He was appointed medical director of Consolidated Edison in 1937 and assumed the duties of personnel director in 1939. In 1946 he became an assistant vice president of industrial relations and in 1950 was elected a vice president. During the last war he served as a consultant to the Secretary of State.

Under his direction, an employee medical and benefits program was developed. Dr. Wittmer was a pioneer in the theory that alcoholism should be treated as a disease. His plea for joint action by industry to solve the problems of alcoholism among wage-earners resulted in his appointment by the Yale University Center of Alcohol Studies as chairman of a national advisory council of leading industrial and commercial companies.

Dr. Wittmer was instrumental in organizing the late Mayor Fiorello H. LaGuardia's Health Insurance Plan to benefit municipal employees and their families. He was also a past president and director of the American Association of Industrial Physicians and Surgeons and of the Association for the Advancement of Industrial Medicine and Surgery.

Economics of the American System

By Edwin Vennard

Vice President, Middle West Service Company

An address before the Eighteenth Annual Conference of the Southeastern Electric Exchange, Boca Raton, Fla., April 11, 1951

THE greatest problem facing the American people today is *how can we keep freedom?* It is a part of the problem that has faced mankind since the beginning of history. Civilizations have grown when man has achieved some degree of individual freedom. Dark ages have prevailed when he has not.

Forces from Within

More often than not, people have lost their freedom by reason of forces acting from within the country. In recent history we have witnessed this loss in many countries. Germany and Italy are examples. England is on the way. Thoughtful Americans believe it may be happening here.

The problem has to do with man's mind, his hopes, beliefs, desires, aspirations, his moral fiber, knowledge of public affairs and business affairs. Free men will not willingly lose their freedom to inside forces if they have the knowledge and will power to do the things necessary to keep freedom.

During the middle 30's a technique was developed for measuring the mind. It is called the sampling of public opinion. By this process we can measure what men think and why they think as they do. Here is how it works.

Measuring the Mind

First, a measurement is made of man's belief in those things which might lead to a socialist state and loss of freedom. Such questions as these are asked:

1. Are you in favor of government operation of banks and basic industry?
2. Are you in favor of government's guaranteeing jobs to all?
3. Are you in favor of government price-fixing in peace time?
4. Are you in favor of top limits on salaries?

As preliminary tests these questions were asked of people known by public utterances to be socialists or communists. Some 90 per cent answered the questions in favor of more government operation and control. The questions were then asked of a group of people known by public utterances to be believers in the American system. Some 90 per cent of these answered the questions as being opposed to more government operation and control.

Thus, questions became a yardstick to measure belief. During the late 30's almost half the American people answered these questions the way the socialists or communists would answer them. Those people were socialistically inclined but did not know it.

Second, it is possible to construct a similar yardstick to measure knowledge of economic facts. It consists of questions such as:

1. What is the average profit made by industry?
2. Of all the money going for wages and profits, what per cent goes for wages?
3. Do machines put people out of work?

About 10 carefully phrased and constructed questions on facts produced a reliable measuring scale.

Belief and Fact

Comparison of beliefs with knowledge of facts reveals that substantially all of the belief in collectivist ideology can be traced to lack of knowledge of economic facts and principles.

For example, the people who answered the facts correctly were separated from those who answered the facts incorrectly. The informed people were then analyzed to determine how they answered the questions respecting the collectivist ideology. About 80 per cent of the uninformed people answered those test questions the way socialists and communists answered them. On the other hand, about 80 per cent of the informed people, that is, the people who answered the questions of fact correctly, answered the questions on ideology the same as the believers in the American system.

This being true, we have an important key to the problem of how to keep freedom. The way to keep freedom is to inform people as to economic facts and principles. The American people are intelligent enough to form their own conclusions on ideology, once they are given the facts.

Those who have access to economic facts and who know economic principles have the responsibility of bringing them to others. These include teachers, clergy, editors, community leaders, and businessmen.

Avenues of Information

There are many avenues for informing people: radio, magazine and newspaper advertisements, addresses, periodicals, newspaper columns, and the like. The most effective and direct avenue is through personal contact in small discussion groups. Here management of industry has an unusual opportunity. Employees can be assembled in groups of 20 or 30 with trained leaders conducting discussions lasting from one to two hours. This is the most effective way known to communicate facts to others.

Here is a brief summary of a program designed for conference groups. This is how it was prepared.

A determination was made of the basic economic facts and principles, the ignorance of which permits a belief in collectivism. Then a program was designed, using the spoken word, written word, color, charts, props, and group discussion to communicate these facts and principles to members of a discussion group.

Purposes of Pretest

The program was first tried on a group of electric company employees in the coal mining areas of Southern Illinois. The purpose of the pretest was to determine first, whether or not the facts were communicated, and second, whether or not there was any change in the collectivist inclination. Measurements were made of employees' knowledge and beliefs *before* and *after*. The early attempts indicated that some of the facts were not communicated. The program was redesigned over and over again until it did work. Not until then was it

put into final form. The construction of the program required approximately three years.

One part of the program was a three-day school for conference leaders. These leaders were selected from the company whose employees were to be informed. After being trained, the leaders then conducted the program in employee discussion groups.

Points Covered

Some of the points covered in such a program may be summarized as follows. The material used is largely from government sources.

1. Work is necessary to satisfy human needs. When one man lives alone, the problem is simple. It is work or die.
2. Group living is different. Then the groups must do four things:
   a. Force or persuade people to work.
   b. Decide what to produce.
   c. Decide who produces what.
   d. Determine the division of products.
3. Americans use the persuasion (rewards) system as distinguished from the force system to get people to work. The American system rests on five principles:
   a. Private property.
   b. Free market.
   c. Profit and wage incentives.
   d. Competition.
   e. Government regulation, not government operation.
4. The American system works. This is the first test of any system.

Here 15 men are asked to assemble themselves around a table to represent all the people in the world, only one of whom is an American. The conference leader then divides up the land surface of the world by slicing modeling clay from a pie plate. The American is given 1/16 of the land, the other people are given the balance of the land. This establishes the fact visually that Americans are only seven per cent of the world's people, living on six per cent of the world's land. The leader then divides up the world's goods.

a. The leader takes from his kit four automobiles, these representing all in the world. He gives the American three and scoots one down the table for the other 14 people to take turns riding in.
b. The American is given three bathtubs and the others are given one to use among themselves.
c. The American is given a radio and the other 14 must divide one radio amongst them.
d. The American is given a telephone, while the other 14 must use a party line.
e. The 14 non-Americans are given a small package of coffee, while the American is heaped high with it.
f. Each non-American is given a small strip of silk, while the American is given a bountiful piece.

This demonstration illustrates the fact that Americans own ¾ of the world's automobiles, ½ of the world's radios, ½ of the world's telephones—use ½ of the world's coffee, 2/3 of the world's oil, 2/3 of the world's silk.

5. The American system protects human values.
   a. The average American has four times the housing space of the Britisher and 10 times the space of a Russian.
   b. Americans eat better by far than any people on earth.
   c. For a month's work an American can buy four suits of clothes, a Russian ½ suit of clothes. For a week's work an American can buy six pairs of shoes, a Russian ½ pair of shoes. For an hour's work an American can buy six quarts of milk, an Englishman three, a Russian 1/3.
   d. How long does it take to earn $10? In Russia 81 hours, in England 19, in America eight.
   e. The American diet in terms of minerals, calories, and vitamins is three times as great as it was in 1910.
   f. Since 1900 life expectancy has increased from 48 to 68.
   g. Infant death rate has dropped more than half in the past 30 years.
   h. Pneumonia, tuberculosis, diphtheria, and typhoid have been substantially reduced since 1900.
   i. In 1910, 44 out of 100 children were in school. In 1947, 79 out of 100 were in school.
   j. We are buying more security in terms of life insurance than any nation on earth.

All of the above facts and the ones to follow are illustrated by charts.

How We Share our Wealth and Income

Critics of the American system admit that it produces the goods and services men want, but the critics say that workers do not get their share. If true, it is a serious criticism. If not true, we should know it. What are the facts from government sources?

1. By bar charts, it is illustrated that employees get 64.6 per cent of all of the national income. All stockholders of all companies and corporations get 4.1 per cent of national income.
2. Government takes from corporations more money than corporations pay to the owners.
3. All income on property (income to landlords, stockholders, bond holders, and rent payments to individuals) amounts to only 12 per cent of national income, as contrasted to 64 per cent going to employees in wages and salaries.
4. Who are the owners of property? A study made by Notre Dame University indicates that 73 per cent of all income on property—all income from stocks and bonds and rent payments to individuals—73 per cent of all of this income goes to people making less than $100 a week. American employees are the capitalists in America.
5. There are not many very wealthy people. After income taxes, 90 per cent of all national income goes to people with incomes of less than $100 a week. After income taxes, only 1.3 per cent of national income goes to people with incomes of more than $25,000 a year. If we shoot all of these rich people and take all of their income and divide it among all others with incomes of less than $5,000 a year, each of those would receive four cents a day.
6. How big are profits? The average factory employee thinks they are 25 per cent. The employee thinks 10 per cent is fair. Government figures showed that all corporation profits average four per cent on sales for the past 21 years. During the last three years profits on sales have been running between six and seven per cent. On the average, profit is a nickel and not two bits out of the dollar of sales.
7. How do we share our income? A 21-year study of government records of all corporations indicates that about 70 per cent of the income of corporations is spent on replacement and material, supplies, rental, heat, and the like. Of the balance available for employees and owners, employees get 85 per cent and the owners get 15 per cent.

When asked this question in surveys, workers say that employees get 25 per cent of this income and owners get 75 per cent. The facts are exactly the opposite of what people think. Here is a ba-

sic cause of strikes, sit-downs, and feather bedding.

8. The division of income between employees and owners is remarkably constant. However, both employees' and owners' income increases with increased production. The only way to get more real income is through increased production.

How did America become the richest nation on earth?

1. Americans use machinery to do 94 per cent of their work. Most people in the world use muscle power or animal power.
2. The American factory with its machinery produces 42 per cent of all the goods made in the world.
3. With the electrically driven machine, the average American factory worker has the equivalent of 142 helpers. Each American factory worker has his ability multiplied 142 times with the electrically driven machines at his disposal.
4. These machines have been bought with savings—savings of the American people accumulated through self-denial.
5. The real income of the worker in terms of what he can buy has increased over the years directly in proportion to the increase in the value of the tools placed at his disposal. Contrary to the prediction of Karl Marx, machines have not increased the worker's hardship. The machine has emancipated the worker and increased his real income. The more machines we have, the greater the real income of the American worker.
6. The American system is not perfect, but it has produced the kind of things men want. It can be improved continually, provided Americans do those things necessary to keep their freedom, so that they can be free to improve it.

Does the Program Work?

This system of employee information on the American economic system works. Many companies have used it. Most companies have made a measurement *before* and *after*. The facts get across. Furthermore, measurements have been made four months after the course. There is practically no slippage or loss of knowledge on the employees' part. And with the communication of facts, belief in the socialist or collectivist ideology is approximately cut in half.

Electric Companies Develop Nation-Wide Plans for Rural Electrification Week

MARKING the great progress that has been made in farm electrification and the major role that business-managed utilities have played in this achievement, Rural Electrification Week, beginning on August 26, will be publicized by means of radio broadcasts, newspapers, magazines, and local observances.

Sponsored by the companies in the Public Information Program, headed by J. W. Parker, president, The Detroit Edison Co., Rural Electrification Week celebrations are being directed by a committee under the chairmanship of Grover C. Neff, president, Wisconsin Power and Light Co. The Public Information Program reports that celebration will be virtually industry-wide, for enthusiastic support of Rural Electrification Week has come from many sources.

Indicative of the observances being prepared by individual electric companies are the plans of the Pacific Gas and Electric Co. PG&E proposes to run 280 advertisements dealing with rural electrification in daily and weekly papers. In addition to newspaper coverage, the company plans to use window displays, group meeting programs, appropriate articles in the company house organ, which goes to all company customers, and special programs before 4-H Clubs to further publicize the contribution made by business-managed utilities to rural electrification.

The Puget Sound Power and Light Co. has announced that it will use all aids available for participation in Rural Electrification Week, including Puget Power's Farm Forum radio program. The Cincinnati Gas and Electric Co. is planning displays at county fairs and a rural electrification edition of its tabloid newspaper, and Iowa utilities are considering state-wide observances.

New York State's celebrations are scheduled to take place on June 30 at farms in the Mohawk Valley which have had electric service for 50 years. Leland D. McCormac, vice president, Niagara Mohawk Power Corp., is chairman of the events, at which Governor Thomas E. Dewey and Dr. William Meyers, dean of the College of Agriculture, Cornell University, will be among the speakers. Also featured will be the Glee Club of the Rochester Gas and Electric Corp., singing songs of a half-century ago.

Three major radio networks — the Mutual Broadcasting System, the American Broadcasting Co., and the National Broadcasting Co. — will salute rural electrification with specially planned programs in July and August. The Columbia Broadcasting System will also present a feature on rural electrification as a part of its regular farm program conducted by Claude Mahoney. In addition, rural electrification will be used as a theme for radio advertising by the Ford Motor Co. and the J. I. Case Co.

On Sunday, August 26, the day on which Rural Electrification Week is to begin, Mr. Neff, chairman of the electrification program committee, will be the guest of Bob Considine over 166 NBC stations from 2:30 to 3:00 p.m., E.D.T.

Collier's magazine is contributing to Rural Electrification Week by publishing an article, "Pushbutton Farming is Here," in its September 1 issue, which will be on the newsstands Friday, August 24, and a special farm electrification supplement will appear with the July issue of *Electric Light and Power* magazine, which will deal with the industry's role in the electrification of America's farms.

The rural electrification story has been told recently in weekly and daily newspapers, including the *New York Times, New York World-Telegram and Sun,* and the Scripps-Howard syndicate, and it will be further publicized in business and industrial periodicals. The Vegetable Growers Association will use it in a news letter, and General Mills and Borden's will feature it as a theme in publications.

Rural Electrification Week will be brought to the public in another manner by Abercrombie and Fitch, New York sporting goods store, which will use it as the basis of a window display during the week of August 26.

To subscribing companies, the Reddy Kilowatt Service has made available several advertisements and "drop-ins" on Rural Electrification Week, which are suitable for local company advertising, and the ECAP mat service will release similar advertisements this month.

Through the observance of Rural Electrification Week, it is hoped that the public will become increasingly aware of the past record and continuing leadership of the privately-owned electric companies in the field of farm electrification.

Evaluating Operating Performance and Personnel

By A. J. Gregory
Internal Auditor, Wisconsin Electric Power Company

An address before the National Conference of Electric and Gas Utility Accountants, Chicago, Ill., April 23-25, 1951

INTERNAL auditing had its origins as a policing function and was largely concerned with the detection and prevention of fraud. As internal auditing progressed, the internal auditor extended his horizons and became concerned with more and more of the operations of his company, and although the auditor is still concerned in the detection or prevention of fraud, he is equally concerned with the operations of his organization from the standpoint of efficiency.

Evaluation, a Responsibility

The internal auditor cannot afford to by-pass this phase of his responsibility, if he wishes to be recognized as an integral part of management organization. This is especially true of the larger organizations, where management develops the broad program of operations and policies and must delegate the responsibilities for carrying out this program to others. It is the responsibility of the internal auditor to assist management in determining that its delegated functions are being performed satisfactorily and that the organization is operating efficiently.

The efficiency of an organization is largely dependent upon two factors—personnel and operating performance. These factors are closely related, and the auditor must recognize this relationship. For the purposes of this discussion, let us first give consideration to the human component—the evaluation of personnel.

Performance Appraisal

The appraisal of employees and their efforts is not necessarily confined to the internal auditor. Some phases of this work may be performed by wage and job specification staffs, management engineering firms, and others. However, the internal auditor, by the very nature of his work, is in an advantageous position to appraise employees and their performance. In this connection, the internal auditor should exercise caution in attempting to appraise or evaluate the technical abilities of individuals with whose work he is relatively unfamiliar. It will take a good many years' experience, as well as technical knowledge, before the auditor can evaluate such skills.

An evaluation of personnel is generally a corollary of other auditing work, and it is possible for the internal auditor to make appraisals of efficiency without employees being too conscious of the fact that he is there for that purpose. The auditor will have knowledge of the internal controls applying to the work performed by employees which enables him to determine the manner in which inefficiency in one individual affects the work of others. Likewise, the auditor is in an ideal position to observe whether employees are working harmoniously as a team toward the objectives the company is seeking, as well as merely performing efficiently as individuals. The auditor often is in a position to assist management in arriving at an opinion of an individual who is being considered for promotion. The scope of the auditor's activities is by no means limited to operating personnel; he should be equally concerned with standards of efficiency at supervisory levels.

Evaluation Procedures

So far we have considered why the auditor should evaluate personnel. Let us next look at the means by which this is done. Personnel psychologists have established certain requirements for the evaluation of personnel. First of all, the means of evaluation must be relevant. For example, if the auditor were to come to any valid conclusion as to the accuracy of an individual's work, he would more properly base his judgment upon the accuracy with which a certain sample of work was performed than upon a non-relevant factor, such as the time required to perform it.

The means of evaluation must also be reliable. This means that there must be a high degree of correlation between the type of work evaluated and the type of work used in establishing standards of efficient performance. For example, any sample of work selected by the auditor for evaluation should be a cross-section of the work normally performed by the individual being evaluated.

Free from Bias

Evaluation procedures must be free from bias. The internal auditor is trained to be objective in his thinking. Moreover, his contacts with operating employees are more casual than those of line supervisors, for example, and it is consequently much easier for his judgments to be unbiased. In his contacts with employees, however, the auditor should be careful never to assume an attitude of superiority because of the resentment that may be created within an employee and which in turn can impair the effectiveness of the auditor's evaluation.

Finally, evaluation procedures must be practicable. This means that there must be definite limits to the amount of time which can be spent and the amount of disturbance to operating routines. Here, too, the auditor has a distinct advantage, for employees expect a certain amount of interruption during the course of an audit and will not be unduly disturbed by the auditor's presence. In most cases the additional time required by the auditor to increase the scope of his audit to include personnel evaluation will be slight.

The means by which employee performance may be measured are (1) determination of knowledge or understanding, (2) review of performance records, and (3) evaluation by observation.

Determination of Knowledge

The first method is widely used by line supervisors and by staff personnel engaged in systems work. The determination of knowledge or understanding of a certain job can be made by having the employee explain why a certain job is being done and how it should be performed, or by having the employe write out the answers to questions designed to test his knowledge of the job. This method can be used to advantage by the

auditor, when in the course of an audit he has occasion to question an employee about some of the details of his work.

The second method, review of performance records, can be used in cases where the work performed by an employee results in records which reflect his performance in terms of output. This method is most commonly used by auditors in evaluating personnel efficiency, since they are already concerned with records in connection with the major objectives of their audit. Although that type of evaluation is performed by nearly every auditor, its significance, in many cases, is overlooked because the auditor may be solely concerned with the accounting aspects of the work he is reviewing. It is quite likely that the auditor is subconciously evaluating the employees but fails to give the matter any consideration, because he does not recognize that it is a proper phase of his audit. The auditor should realize that management is not only concerned with internal controls but is equally concerned with personnel efficiency.

The third method, evaluation by observation, is in all probability too often neglected by auditors. However, in any instance where an employee's work does not leave a record of his performance, observation is the best means available to the auditor to determine whether employee performance is adequate.

Although time does not permit an explanation as to how these principles can best be applied by the auditor, the following case is typical of the findings which may result from a personnel evaluation made during the course of an audit.

During an audit of a branch office, many clerical errors were found in the records examined, it appeared that the records were carelessly kept, and there was evidence of deviations from established procedures. The auditor noticed that although the majority of employees were only moderately busy, the branch office supervisor was overwhelmed with a vast quantity of records and clerical detail. Most of this work was of a nature that should have been delegated to the clerks in the office.

However, from the auditor's conversation with the supervisor, it appeared that the latter had very little confidence in the ability of his people to do the work properly. In consequence he was doing a poor job of supervision as most of his time was involved in details. This condition was discussed with management and corrective action was taken to give the branch office supervisor further training.

As I indicated before, there is a very close relationship between personnel efficiency and operational performance. For this reason, in evaluating personnel, the auditor must also give consideration to the factors which are necessary to obtain efficient operating performance. These factors include office and plant facilities and office and plant layout but are by no means the only factors involved. Company policies and procedures are also important.

In any audit, an auditor should never take for granted the method by which an operation is being performed. He should always be alert to detect any situation where the productive effort of employees is being hampered by inadequate facilities. You cannot expect to get optimum performance from efficient employees if they are handicapped with antiquated facilities and do not have the proper tools with which to work. On the other hand, the finest facilities and tools will not in themselves result in efficient operating performance if personnel efficiency is lacking. The auditor should always give careful consideration to both factors before making any recommendations for improvements in facilities.

The auditor should give much the same consideration to office and plant layout as he gave to facilities in evaluating operating performance. Improper placement of office machines, files, desks, storeroom bins, and other facilities can result in a low level of operating performance. An auditor's evaluation of this factor during an audit is not always easy. In some instances the improper placement of facilities may be fairly obvious. But in other instances the auditor must spend considerable time in observing the flow of work in order to determine whether improvements can be made in layout, which would result in higher productivity.

In one of our recent inventory audits, we came across a situation which illustrates how an auditor can effectively use principles for evaluating personnel and operating performance to make improvements in operating efficiency which would not have been possible if the auditor had confined his activities to the mere accounting aspects of the audit.

It was noted that in one storeroom a storekeeper was having some difficulty in maintaining his accounting records properly. The auditor reviewed the storeroom accounting records, observed the manner in which the storekeeper performed his work, questioned him concerning some of the details of the procedures he was supposed to be following, and reviewed the storeroom facilities and layout and the general housekeeping practices.

As a result of this study, the auditor recommended additional training for the storekeeper and additional personnel for the storeroom, since part of the storekeeper's difficulties was due to the volume of work assigned him. The auditor also recommended a change in the storeroom layout to promote greater efficiency

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West Penn Employees Receive Distinguished Service Medals

TWO West Penn Power Company employees received the company's Distinguished Service Medals at a dinner in their honor held in May at the Monongahela Country Club.

The awards were made to Line Foreman Earl Strausser and Electronics Engineer Reece M. Armstrong for their actions in saving the lives of a small boy, his mother, and great grandmother, who were near asphyxiation from gas fumes in their home in Charleroi, Pa., last December.

West Penn President P. H. Powers made the presentation. Also present for the occasion were Central Division Manager J. V. Soisson, District Manager A. R. Newell, Operating Practices Engineer H. F. Kelso, and Superintendent of Lines R. C. Dewey, all of Charleroi.

Mr. Strausser has been a West Penn employee for over 27 years, all of which have been spent in the Charleroi district. Since 1934 he has been line foreman.

Mr. Armstrong, who is also a 27-year veteran of the company, started as an electrician at Connellsville. He worked on radio construction in Pittsburgh and Connellsville before coming to Charleroi in 1948 as electronics engineer.

The company's Distinguished Service Medal and Certificate are awarded to employees for outstanding service in the endeavor to save human life, or for outstanding public service under unusually difficult or dangerous circumstances beyond the ordinary requirements of their duties.

The Electrical Industry Looks at 1951

By J. M. McKibbin

Vice President, Westinghouse Electric Corporation

An address before the Eighteenth Annual Conference of the Southeastern Electric Exchange, Boca Raton, Fla., April 12, 1951

YOUR chairman has asked me to discuss the immediate and long-range future of the consumer goods business. That's a large order any time. It is even more difficult under the conditions that face us today. Even if those conditions were to "stay put" it would be quite a challenge to attempt to predict the future. But in the kind of world we're living in in 1951, world events are forcing us to revise our outlook every month—sometimes every week. Or, as one of our production men puts it, "We have a new crisis every day."

Market Shift

Several months ago, when I accepted the invitation to appear here today, our company, like the rest of the industry, was planning on the probability of an all-out conversion to war work. Every trip to Washington brought back the news that there would be fewer and fewer materials available for manufacturing consumer goods. We were analyzing war projects with the hope that we could keep our people working when the last appliances and TV sets rolled off the assembly lines. Salesmen were wondering how soon they would become expediters on war work. Even most of the bullish prophets pointed to a real shortage of consumer products—another seller's market comparable to 1941.

Contrast that climate with a sales meeting I attended just last week. Believe it or not, that was a meeting to discuss plans for moving television inventories that had built up at the dealer level. In just 60 days the scene shifted from a seller's market to a buyer's market on TV, and many believe the same thing may happen on appliances.

Long-Range Viewpoint

Now, I mention this market shift for one big reason. I believe it points up the need for us to take a long-range viewpoint in our planning. The short-range viewpoint sometimes causes us to do some amazing things. In industry we cut production, or we step it up radically; we cut our sales and advertising budgets, or we double them. And no doubt you can think of the same kind of quick judgments that are sometimes made in the utility industry.

I am not advocating a lack of alertness, nor the kind of rigid management policies that prevent our shifting quickly to take advantage of business opportunities. I am suggesting, rather, that we make our short-range decisions against a backdrop of long-range objectives and long-range plans. We are going to have problems in the future just as we have had in the past. In the last 25 years we have lived through a boom, a bust, the depression, a recession, World War II, and reconversion. Yet, these were the same 25 years that saw the electrical industry rise to new heights of achievement.

Mistakes of Quick Judgment

We have problems today. There is uncertainty; there is, unfortunately, more than a little confusion. We know we have a mighty defense problem. We know the war effort must come first. And yet, we know, too, that it's not good business, it's not good planning, it's not even good patriotism to refrain from planning and activating programs that will in the long-range carry electrical living to everybody. If we as management keep this long-range objective—electrical living for everybody—in the forefront of all of our planning, I believe we can avoid many of the mistakes of quick judgment that were made in the closing months of 1950. Sometimes, too, we can look forward best by taking a quick look back at the path we have recently traveled.

Throughout the past ten years American industrial expansion has been tremendous. Our overall productive capacity is now more than half again as much as it was in 1940. Since VJ-Day this country has been producing consumer goods at an accelerated rate. Last year shattered all records for the manufacture of consumer products; 1948 was the second best year; and 1949 was third.

You know that the utility companies have paced this expansion. You have doubled your residential load per customer in the past ten years. Your average revenue from domestic customers has increased 50 per cent. There was a time not so long ago when an increase of two million customers in a year was a distant goal. But since the war, you have added two million new customers every year for five straight years, and last year it was a record two and one-third million.

Appliance Sales

Also, last year, the industry sold two and one-half times as many refrigerators as it did in the year 1940, four times as many electric ranges, and eight times as many electric water heaters.

We've seen relatively new products, like the automatic washer, the electric dryer, and the dishwasher, reach volume sales. In five years television sets surpassed the sales of refrigerators, which have always been looked upon as the bell cow of the industry.

There were many causes for this, the greatest seller's market in our history:

1. The population increased by about 20 million people.
2. There was a terrific pent-up demand for consumer goods of all kinds, as a result of the five lean war years.
3. Ten million soldiers returned to civilian life and just about every one of them needed everything it takes to start homes.
4. Millions of women in war work learned the advantages of labor-saving devices and decided to have them in their homes.
5. Full-time domestic help practically disappeared from the American scene. All of these factors contributed to the lush market that followed.

Purchasing Power

But most important of all was the fact that the American worker now had the buying power to turn these human wants into reality. The American worker, after taxes and basic living expenses, had the largest disposable income ever known for all types of consumer products.

Since the war, then, we have enjoyed our biggest market, with demand generally running far ahead of supply. Only in 1949 did we have a slowdown in the market. As we look back on that fateful spring, we realize that this slowdown was not the result of a buyer's strike. It resulted from retail jitters induced by high inventories which, by the fall of 1949, were dispelled by a new demand for goods.

Creative Salesmanship Lacking

Just a week ago I talked to the commercial people at the EEI Sales Conference in Chicago. I called their attention to the fact that the spring of 1949 did prove one thing. It was the only real sales test we had in the postwar period, and creative salesmanship was found wanting. A whole generation of sales people had grown up in the soft, unrealistic atmosphere of product shortages. Your commercial managers, with sales managers the country over, complained about the lack of the tough, two-fisted, sales crews of the early 30's.

If we as management are to take a realistic view of the future, it would seem that we should first accept this point: our spectacular success of the past five years resulted from conditions, and *not* from hard selling. Once we do this, it seems that we are in good position to appraise the job our sales people have ahead of them in working toward the goal of electrical living for everybody.

There are three aspects to this job. One is the market opportunities. The second is product availability. The third is the strategy necessary to accomplish our objective.

In all of this thinking I am linking the manufacturer and the utility together, because we must jointly spearhead this big task. It is the basic decisions of management of utilities and of industry that cause retailers, large and small, to hop on the electrical living bandwagon.

Market Opportunity

Let's take a quick look at just one segment of our market opportunity. Only 21 per cent of the wired homes have electric ranges. That means that 79 per cent of the market lies ahead. Eleven per cent have electric water heaters. Eighty-nine per cent of the market lies ahead. Fewer than 1 per cent have electric dryers. Ninety-nine per cent of the market is ahead of us—ahead of you for revenue-building. To us this spells opportunity.

Next, what about future product availability? In our company we make and market many products. We are in touch with practically every industry in the country. If the orders on our books today indicate anything, they show quite clearly that American industry is being expanded at a tremendous rate.

This simply means that in 15 to 18 months from now this country may well have the necessary materials and physical plant to support both a limited mobilization program and an expanding peacetime economy. Before many months have passed, the consumer goods industry could find itself in a position to equal, or even surpass, the consumer goods production of 1950, our greatest year.

What happens when we are fully rearmed and begin to place our armed forces on a "standby" basis? What happens when we check communist expansion? What happens when this emergency is past?

Increase in Productive Capacity

One thing is obvious to those of us in the manufacturing end of our industry —that the facility to produce consumer goods, when the emergency is past, might well be twice as much as its capacity to produce in the miracle year, 1950. This means that a billion dollars' worth of traffic appliances will be available where only a half-billion was available before. It means that probably two TV sets will be available where one has been available in the past.

It means, finally, that the salespeople of this industry, whether utility salespeople or manufacturers' salespeople, will have to step up operations sharply. Our sales problem will not be one of gradual increase such as we have enjoyed over the past five years. It will be one of doubling our sales results practically overnight.

Is this a possible goal? In 1940 the average home had very few heavy load-building appliances. A refrigerator, perhaps; some type of washing machine; a vacuum cleaner; and some traffic appliances. Today we find ourselves with something over 1800 kilowatthours per residential customer.

Several utility men have told me that range and water heater installations alone have accounted for 80 per cent of their average kilowatt increase per home since the war, and the potential of these products has hardly been scratched. The dryer and the home freezer market are just opening up.

The last war stimulated research by about five times its natural pace, and who knows what new products, or major improvements on old ones, will develop tomorrow, or next year, or the year after? It is quite apparent, I think, that a goal of 4000 kilowatthours per home in this country by 1960 is a reasonable and attainable objective.

Source of New Business

Where will this increased business come from? It must come from everybody. Every wired home in this country represents an important market. Even taking the depreciated dollar into account we find that disposable income per capita is 50 per cent greater in 1950 than it was in 1940. All of these people want the best of everything, and as long as they produce it and earn it, they are entitled to it.

Certainly TV has shown us that when people, wherever they live, whatever their job, want something hard enough, they will get it. It wasn't the low-priced table model that went into the smaller homes. These homes took the cream of TV production, simply because the people wanted the best in TV.

This desire for the best is not limited to TV. We had a number of checks made of the most recent 100 sales of major appliances in several cities. We found that more than 80 per cent of these products went to the homes of industrial workers, and, further, that 90 per cent of these were deluxe models. It was not uncommon to find a $400 refrigerator taking a place of honor in a home that obviously cost no more than $3,000.

My point is that, historically, we have fallen into the habit of thinking of workers as people who have less. Thank goodness, that isn't true. There is only one market in America and that's a big market, a ready market, a mass market that has accepted the idea of electrical living.

The Mass Market and Free Enterprise

Moreover, there is an interesting public relations angle from your standpoint in approaching this mass market. This mass market is also making the greatest political impact these days because it embraces so many people. The best way for them to appreciate the fruits of free enterprise—the best way for them to appreciate the contribution of the electric utility—is for them to see the benefits electricity provides right in their own

homes. A nation with comfortable homes, staffed with efficient electrical servants, will be far less likely to be interested in novel political experiments than if the reverse were true.

It is our job to develop this single market. We must interpret the benefits to be gained from electrical living in such a manner that it will buy electric power and electrical appliances, rather than competitive goods. We have in electricity the most magic fuel in the world. It's clean, it's safe, it's fast, and, thanks to your efforts, it's sure. It's available to more people in this country—more homes in this country—than any other fuel. It reaches 39 million of our 43 million homes. We must make electrical appliances, and what they will do in terms of better living, so dramatically understood by the home owners of America that there truly will be electrical living for everybody.

Even in these unsettled times I believe that we, as management, should give the green light to our promotion and sales effort. The fact that we face uncertain conditions is no justification for curtailing sales efforts.

We certainly must not lose the momentum we have built since the end of the war. Public acceptance isn't a faucet that can be turned off and on at will. Competition does not intend to stand still. The electrical industry has always moved from periods of uncertainty to new heights.

Manufacturers' Responsibilities

In order to accomplish the goal of electrical living for everybody in the next ten years, we manufacturers must face certain responsibilities:

1. We must engineer our products so that we bring them out with improved features.
2. We must style these products so they have maximum appeal to the buying public.
3. We must continuously strive to achieve lower costs so that we can price our products in a way that will widen our markets, not shrink them.
4. We must develop more aggressive sales training programs.
5. We must do a form of interpretive advertising that will make electrical consumer goods the most wanted products in America.

I think that you, as utility management, have a corollary responsibility:

1. We ask you to co-operate fully with manufacturers in sales training work at the dealer level. In fact, your sales people have an opportunity to take a lead in this all-important work.
2. We ask you to continuously find ways to reduce the buyer's resistance that comes from high installation costs.
3. We ask that you maintain a continuity of advertising and promotion effort to sell the idea of electrical living. We suggest you look upon this, not as an expense, but as a continuing investment in the future of your business.

We have looked back to 1940 and we have looked forward to 1960, but I know very well that you are most interested in 1951. I am told that you want to know what, in our opinion, is likely to happen in our industry in the next few months. Before attempting to answer that question it might be well to consider the background of the problem.

Infinitely Better Prepared

First, I believe the whole country has begun to realize that 1951 is not necessarily 1941 all over again. We are infinitely better prepared today than we were in 1941 in the four basic needs of our economy: men, machines, materials, and power. World War II hit us after 20 years of peace and ten of depression. In 1941 it was necessary to build much of our facility. Today, that facility is ready. Today, we are arming fewer than 4 million men as compared to 12 million then.

I draw two conclusions from this. Barring, of course, all-out war, there will not be a freeze on consumer goods. Moreover, there is not going to be the same buying stampede that we had in '41. No, '51 looks like a far different year than '41, and the public is beginning to think so, too.

With this as a background, I wondered what questions you would have in mind and would ask if the meeting were thrown open to questions. Then I remembered that just a few weeks ago Mr. Price, the president of Westinghouse, held a press conference in New York with his staff present. The press was represented by some hundred reporters and editors from virtually all fields of publishing. I think that penetrating questions they asked would be very similar to yours.

The first question they asked was this: what do you see ahead in production for 1951? In addition to the latest Washington point of view, I have checked the thinking of a number of other manufacturers in our industry. The consensus at this moment is that we will turn out as much civilian product in 1951 as we did in 1949, the third largest production year in history. This means that our production will be off 20 to 25 per cent from the record year of 1950.

Another question: what about the use of substitute materials and how will they affect product quality? Before Mr. Price turned this question over to me for development, he said this, "Speaking for Westinghouse, I should like to say that if the time comes that we can no longer produce a quality product, we will stop making that product."

I'm sure that that same answer would be given by the management of all leading consumer goods manufacturers. Quality is uppermost in the minds of these people. We who have worked with you over the years in developing this business aren't going to be so shortsighted as to let substitute materials result in substandard products. We aren't in this business for a day or a year. We're in it for keeps. We have our reputation at stake and we certainly aren't going to take any chances on losing it in return for a quick profit.

Another question. What about stripped-down, or so-called austerity models? The postwar years have shown rather clearly that Americans want the best. There has been very little interest in the stripped-down product. And since we're in business to serve the wants of the people, you can be sure that we'll come up with the products they want.

The time may come, however, when materials will be limited by a drastic change in the international situation. In such a case the government may ask all manufacturers to build so-called austerity, or victory models. But that time isn't here yet and I, for one, hope it never comes.

Restrict Number of Models

Another question. Do you plan to shorten the number of models in your line? I can't speak for all manufacturers, of course, but since they are all confronted with the same material shortages that we are, I assume there may be a general tendency to reduce the number of models of a given product in order to get out more of the popular models from the materials available.

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Cooperation of Utilities with Civil Defense

Report of a Committee of the New Jersey Utilities Association

A. R. Nelson, Public Service Electric and Gas Co., *Chairman*

THE purpose of this report of a committee appointed by the New Jersey Utilities Association is to outline specific means whereby the State Civil Defense organization and the utility companies throughout the state can accomplish maximum effectiveness in the restoration of utility services in the event of a major disaster. Such effectiveness will result from mutual cooperation and careful planning in advance concerning the many jobs to be done.

Scope of Reference

The report is written to refer particularly to the electric and communication utilities. The water utilities are working on their problems directly with the State Department of Health and with the Department of Conservation and Economic Development. The Division of Water Policy and Supply has reactivated the Joint Operation Board, which consists of the operating men in charge of the largest water systems in northeastern New Jersey. This board is preparing recommendations covering all phases of the water utilities' emergency program, including cooperation with Civil Defense. Therefore, no reference is made, specifically, to the water utilities. However, the general principles brought out in the report apply to all the utilities.

The electric and communications utilities are, by their very nature, service organizations and their past experiences have led to the development of general techniques for meeting emergencies, whether from equipment defects or the acts of nature. The problems of warfare disaster, therefore, call merely for a review and reassessment of those techniques in the light of the probable conditions to be expected.

Utility Repair Crews

No utility expects or deems it wise for Civil Defense to attempt to train personnel to participate in the work of physically repairing damaged utility plant. This task involves special equipment and operations such as climbing poles, handling poles and heavy equipment, and working with relatively high-voltage wires that would be hazardous to men unequipped for, untrained in, and unfamiliar with such work. This work should, therefore, be handled by the utilities with their regular, specially-skilled utility employees. Civil Defense, accordingly, should not plan on utilization of this pool of normal utility manpower and equipment for any other purpose, but should consider it as a separate entity allied with Civil Defense. It is proper that Civil Defense should know what the utilities' plans encompass and the first part of this report will deal with that subject.

The assistance which Civil Defense can render the utilities requires that the latter be ready to provide certain information for Civil Defense educational purposes because of the highly specialized nature of the undertaking. Description of what is offered by utilities for this purpose forms another section of this report.

The last section of the report will detail the things which Civil Defense can do to materially aid the utilities.

Greater Formalization of Plans

As mentioned previously, all utilities have, over the years, developed plans for meeting emergencies. However, as a result of the ice storm of January 1, 1948, which did great damage to utilities over a large area of the state, a special "Committee on Emergency Research and Planning," composed of representatives of the communication and electric utilities and the Board of Public Utility Commissioners, at the request of the Governor made a thorough study of the problems of catastrophies and submitted to the Board of Public Utility Commissioners of the State of New Jersey a report of their findings. One of the important findings called for a greater formalization of plans for mobilization and attack. All utilities in New Jersey subscribed to that report and have drawn up detailed plans for their own organizations.

These plans, in general, provide that all available personnel with necessary equipment are assigned to given emergency duties for which they are best fitted, and trained in any special functions required. These assignments are periodically reviewed, brought up to date, and given "dry runs," if necessary.

Emergency Procedure

When an emergency arises there follows:

1. A speedy mobilization of manpower as required.
2. Prompt survey of system for damage sustained.
3. Assessment of the damages to determine adequacy of own organization to cope with situation.
4. Call on prearranged pool of needed manpower, equipment, or materials from neighboring or even distant utilities, when necessary.
5. Clearing of all hazards to the public by special teams of linemen before attempting service restoration.
6. Assignment of service restoration
   (a) To essential community services—water pumping, sewage disposal, hospitals, doctors, Civil Defense agencies, vital defense industries, other utilities, etc.
   (b) To the largest groups of customers which can be reconnected in the shortest possible time.
   (c) To smaller groups and individual customers.
   (d) To street lighting system.

The plans further provide for close coordination of work between communication and electric utilities and with state, county, and municipal maintenance forces.

Not Part of General Network

An essential part of the speedy operation of the plans is the two-way radio system which each company has installed. For this reason these systems cannot be counted on as a part of the planned Civil Defense network for general use.

While up to now the major disasters encountered have involved mostly the outside distribution plant facilities of poles and wires, there have been acci-

dents to main plants and trunk lines, for which the plans provide.

There remains then the question of whether the utilities are prepared to cope with catastrophies resulting from acts of war. It seems hardly conceivable that the general outside plant would suffer such severe damage over widespread areas as has been encountered in recent ice storms and hurricanes. There may be loss of central office exchanges, power stations, substations and trunk cable and transmission lines in certain locations as the result of bombings of various types. But at the same time much of the load requirement will be lost, too.

Utilities have always designed their systems to certain standards of service that call for reasonable continuity of service with the loss of major items of plant. In later years this has been carried to the point, at least among electric utilities, where connections between systems are available for added back-up protection against loss of bulk facilities. It is now necessary that they again review the following principle items of their physical plant in the light of possible war damage:

1. Generating plant
2. Bulk transmission
3. Switching stations
4. Sub-transmission
5. Substations
6. Distribution lines

Similarly, the communication utilities may be faced with damage to, or loss of

1. Toll offices
2. Trunk lines
3. Central office exchanges
4. Distribution lines

General plans should be made for coping with the loss of any such unit or units in the system. For example, facilities should be planned to permit essential calls to be made to and from the area served by a toll center in the event that the equipment at the toll center is out of service. This also involves study of the system for equipment which can be made available in emergency and methods of moving it. It must be recognized that under certain damage conditions the optimum plan will still mean days and not hours of outage. However, it is also probable that such a severe case would involve a large loss of need for service in the area.

An excellent means of reviewing this whole problem for the electric utility is Edison Electric Institute Publication No. 50-14, "Protection of Electric Service from Sabotage and Enemy Action." This shows the attention given nationally to the subject. All New Jersey electric utilities endorse this publication.

In the case of such essential community services as water pumping and sewage pumping it has been the policy of some utilities to call to the proper authorities' attention any need for consideration of reasonably adequate back-up facilities to protect against outage of the normal source of supply. In some cases the practical answer has been the installation by the customer of an auxiliary engine-driven unit.

Civil Defense organizations can contribute considerable aid in the execution of certain features of the utilities' emergency plans, but to be properly prepared to handle the job considerable education of its personnel is necessary. The utilities are ready to proceed with preparation of detailed information on the following items as may best fit into the local plans:

1. *Local Contacts*—Since ultimate handling of all of the work must be on a local plane, utilities are ready to exchange personnel information with all local Civil Defense organizations.

2. *General Information*—To furnish an intelligent background for Civil Defense cooperation, utilities offer to explain to Civil Defense personnel the general layout and principles of operation of electric supply and communication systems.

3. *Restoration Plans* — For further background, utilities are ready to explain their plans for restoration of service following a major interruption.

4. *Instruction in Reporting*—To facilitate reporting, Civil Defense personnel should know what to look for and how to report properly the exact location of the trouble. This instruction would also include information on identification of the various types of utility plant.

5. *Instruction in Guarding Hazards* —Because of the hazard associated with fallen wires and damaged pole plant which might fall, the utilities are ready to give specific instructions to outline the proper way in which this important assignment should be carried out.

The utilities can be helped by Civil Defense in the following ways:

1. *Movement of Utility Personnel*—Since ready movement of utility personnel and equipment in time of emergency is vital, suitable identification should be issued and Civil Defense people instructed to permit passage.

2. *Supply Information*—In case of bombing tell type of bomb, location of ground zero, damage area boundaries, and limits of contamination, if any. Supply lists of essential customers out of service and specific locations of damage to utility plant such as wires down or poles broken.

3. *Guard Hazards*—In an emergency, overhead plant may be in an unsafe condition at numerous locations and Civil Defense can perform a valuable function in standing guard until utility personnel arrive to make repairs.

4. *Handle Traffic*—When major restoration work is in progress, considerable help can be given in directing traffic and diverting it around the job location, and in clearing a way through traffic so that utility crews can more quickly reach the job.

5. *Clearing-Up Operations*—Utility manpower can be used more effectively for service restoration work if Civil Defense will clear up fallen trees and other debris which may be delaying the work.

6. *Patrol Assistance*—Should sabotage be expected, Civil Defense could patrol certain public areas where there are important utility facilities, and at all times should be alert for indications of possible sabotage. The matter of sabotage cannot be too strongly emphasized as being a very serious item, both by itself and as an adjunct to any actual bombing.

7. *Demolition Work*—If Civil Defense should undertake establishment of fire breaks by destruction of buildings, any damage to substations, telephone exchanges, and other important utility plant should be avoided.

Evaluating Performance

(*Continued from page* 188)

and to provide more adequate protection of company materials. The auditor's recommendations were adopted by management and subsequent follow-up of this storekeeper showed a substantial improvement in his work.

In conclusion, I want to emphasize that my discussion of the evaluation of personnel and operating performance should not be considered conclusive. Rather, it was my intention to introduce the subject by touching only upon the major considerations and to indicate some of the basic principles involved.

Purchasing and Stores Committee Meeting

H. E. Hodgson, *Chairman*

THE EEI Purchasing and Stores Committee held its annual meeting at the Lord Baltimore hotel, Baltimore, Md., April 30 through May 2. Sixty-four regular and correspondent members and their guests attended.

With Vice-Chairman C. F. Ogden presiding, the opening day's session featured a discussion of the Defense Electric Power Administration, its operations and duties. Members of DEPA participating were Harry I. Miller, chief of the maintenance, repair, and operations branch; A. G. Skina, chief of the materials and equipment expediting branch; and Leon Brodsky, from the office of the general counsel. A question and answer period followed the discussion.

Committee Reports

Also included in the opening day's session was a report of the Standard Packaging and Nomenclature Subcommittee. G. E. Balch, Duquesne Light Co., reported that work had been completed on approximately 3,400 items of line hardware. The subcommittee recommended that similar work on other commodities be undertaken at an early date.

A panel discussion on the "Economic Handling of Minor Purchases," directed by H. T. Belcher, Consumers Power Co., was held with E. S. Brock, Public Service Electric and Gas Co.; O. H. Aydelotte, Public Service Co. of Colorado; B. T. Walshe, Atlantic City Electric Co.; and John Rieves, Southwestern Gas and Electric Co., taking part.

D. J. Hogg, The Cleveland Electric Illuminating Co., presented a report of a project committee on "The Determination of Cost of Placing a Purchase Order or an Extra Purchase Order." The report pointed out that such costs could reasonably affect the overhead costs in allied departments and should be investigated.

Charles P. Crane, president, Consolidated Gas Electric Light and Power Co., spoke at the Monday luncheon on the effects of the encroachments of socialism on the industry. Committee members spent the evening as guests of a group of cooperating manufacturers, who maintain offices in the Baltimore area.

Tuesday's session opened with a panel discussion on "Materials Control." E. N. Scott, Long Island Lighting Co., led a panel consisting of R. P. Snow, The Cleveland Electric Illuminating Co., who spoke on establishing minimum and maximum stocks; C. I. Richards, Central Hudson Gas and Electric Co., speaking on the handling of excess materials from completed jobs, the reserving of material for projects, and the disposition of scrap; J. B. Thomas, Alabama Power Co., whose discussion of inventories brought about a great deal of discussion among members; C. H. zur Nieden, Philadelphia Electric Co., who spoke on centralized as opposed to decentralized control, and perpetual as opposed to long-range control; F. R. Schaffer, Pennsylvania Power and Light Co., whose subject was control over remote, unattended stocks and overstocks in the custody of user departments; and C. A. Brandow, New York State Electric and Gas Corp., who spoke on reviewing open orders, vendor contacts, and the dispersing of information on procurement time.

A. A. Meisenheimer, Wisconsin Electric Power Co., presented a project committee report on "Material Handling and Storing," which contained statistics on member companies' space requirements for storerooms and storage yards, types of buildings and enclosures, bin types, storeroom equipment, and locations of storerooms in relation to transportation services.

A feature of the Tuesday luncheon was a talk by Dr. R. G. Steinmeyer, professor of government and politics at the University of Maryland, an authority on the Far East who discussed the Korean situation, China, and the general advance of communism.

Closing Session

Among the Tuesday afternoon addresses were "Reports to Management by Purchasing Departments," by W. R. Metzger, Duquesne Light Co., and a talk by R. S. King, Union Electric Co. of Missouri, on "Stores Unit Man-Hour Costs," which included data on the handling of 803 carloads, or over 20,000 tons, of material.

J. B. Homsher, Pennsylvania Water and Power Co., project committee chairman, concluded the business portion of the program with a report on "How To Analyze a Price to Make Sure It Is Fair."

Consolidated Gas Electric Light and Power Co. of Baltimore played host to the committee at a buffet supper at the Maryland County Club on Tuesday evening. On Wednesday morning, for the benefit of committee members, the company held an inspection tour of its purchasing and stores facilities.

Credit for much of the success of the 1951 meeting is due the Consolidated Gas Electric Light and Power Co. and particularly W. M. Holls, general storekeeper of the company, who took care of arrangements.

Transmission and Distribution Committee Meeting

J. E. McCormack, *Chairman*

THE Spring Meeting of the Transmission and Distribution Committee was held on May 1 and 2 at the Edgewater Beach Hotel in Chicago with 155 members and guests in attendance.

Safe Design, Construction, and Operation

The session on safe design, construction and operation, sponsored by L. G. Smith, featured continuation of a panel discussion on the safe plant by J. W. Anderson, W. R. Bullard, J. G. Charest, G. E. Dean, G. H. Fiedler, R. M. Grogan, H. L. Livingood, W. E. Losie, and W. M. Penney. Discussion of grounding of guys showed preferences for grounded guys on grounded wye systems and insulated guys on delta systems. In this connection, caution against relying on treated pine poles as insulators was expressed. A review of experiences with various types of sectionalizing devices revealed considerable dissatisfaction with bayonet and door type fuse cutouts operated under load. Resulting flashes have produced several injuries. Descriptions of general constructional features employed to provide greater safety included longer than normal crossarms at

junction poles, minimum use of multiple arm construction, minimum use of buck arms, and general provision of 40-inch climbing space. Ladders and tower trucks also have been used to reduce exposure on congested poles. Discussion of street lighting circuits was concerned primarily with safe methods of connecting lamps to series circuits. Consideration of the relative safety merits of pocket- versus cover-type transformer bushings indicated that the problem is closely interrelated with the vertical level of the transformer and the type of mounting. Several companies use wood crossarm braces on transformer poles as a precaution against accidental energization, and a few companies use them generally. It was agreed that automatic line splices are safer to install than compression sleeves, because no tools are required, but operating troubles with the automatic splices have led many companies to use them only for emergencies. Discussion of bare versus weatherproof wire brought out that the covered wire provides some protection against incidental brushing contacts, principally during installation.

Standards and Specifications

Subcommittee chairmen outlined activities of the Standards and Specifications Group sponsored by W. E. Losie. M. W. Ghen announced that EEI-NEMA Standards for Conventional Subway Type Transformers have been published. Good progress also is being made on a proposed standard for network type transformers.

R. J. Palmer reported that work is continuing on additional proposed EEI-NEMA standards for street lighting equipment covering poles, luminaire supports, open reflector mountings, cutouts, hood and reflector interchangeability and materials, finishes, and tests. Standards for still other items are planned as soon as the current group are completed.

E. K. Karcher announced that the revision of TD-3, *Specifications for Lag Screws,* has been published. Release of the new specification for guy hooks and strain plates has been delayed pending completion of some strength tests. Proposed specifications for pole top pins and guy clamps soon will be sent to members for ballot. Work on a proposed specification for washers and an expansion of TD-17, *Specifications for Bolt-Type Steel Insulator Pins with 1-inch Lead Threads,* to include 1⅜-inch threads, is under way.

B. J. Barmack, chairman of Subcommittee XIII of ASTM Committee A5 on the Corrosion of Iron and Steel, discussed proposed changes in ASTM galvanizing specifications. F. A. Ashbaugh stated that some problems in establishing knot and grain limitations remain to be settled before the proposed specification for heavy duty crossarms is ready for ballot. Good progress is being made on the proposed specification for full-length, non-pressure treatment of poles, which now has been expanded to cover six species.

W. L. Vest, Jr., reported that the proposed EEI-NEMA standards for distribution fuse links are about ready to be released for printing. R. M. Havourd reported that members cast a favorable ballot on the proposed EEI-NEMA standards for low- and medium-voltage pin insulators. Thus, work on the series of six standards covering insulators used in transmission and distribution is about completed. Additional standards covering switch and bus insulators also are contemplated.

The program of the Underground Group, sponsored by W. M. Penney, was devoted to papers by R. M. Gillette, F. M. Hull, and J. A. TenBrook describing practical considerations in pipe-type cable construction gained from experience with installations in New York, Detroit, and Philadelphia. These covered increasing cable pulling lengths and improved pulling techniques, improved methods of cleaning, covering and handling pipe, welding techniques, testing of welds, moisture control, selection of pipe size, handling somastic, cable splicing, oil pumping plants, and trifurcating joints. It was noted that the popularity of pipe-type cable has increased so rapidly since the war that the total installed mileage already exceeds that for oil-filled cables for voltages 100 kv and above.

General Engineering Group

The General Engineering Group, sponsored by J. W. Anderson, featured a series of papers on load characteristics.

H. R. Wall presented a paper by R. K. Dallas, J. N. Gosinski, E. W. Lehman, and J. H. Thomas describing the characteristics of rural load in an area with an average annual use of 8000 kwh. A principal conclusion was that domestic use is responsible for the largest portion of total use by all except the largest users in the area and that the farm chore load still offers the major potential for future load building.

H. F. G. Main described the effect of uncontrolled water heater saturation on load characteristics. In test areas with range saturations of 80 to 90 per cent increases in water heater saturation from about 30 per cent to 90 per cent appeared to have little effect on peak demand.

A study of water heater load characteristics, presented by C. Bary, indicated that the optimum condition exists when both ranges and water heaters constitute a part of the load and when water heaters are controlled. A relatively short period of restricted operation produces the best load factor with a ratio of two ranges to one water heater, and a longer period is preferable with higher ratios.

H. F. Hoebel presented a progress report on activities of the Joint AEIC-EEI Heat Pump Committee. This group is assembling and analyzing test data on existing installations, coordinating investigations of heat sources, cooperating with manufacturers in their production of equipment, and periodically disseminating information of general interest on the subject.

W. C. Phillips reported that continued rapid expansion of the use of mobile radio is beginning to result in shortages of non-interfering channels in certain areas. This may force the splitting of present channels to half their present width and the use of narrow band equipment.

Overhead Group

The Overhead Group, sponsored by G. H. Fiedler, covered a variety of subjects. W. P. Holben reported further progress in the development of proposed specifications for preassembled aerial cable by the subject AEIC-EEI-IPCEA joint working group. C. H. Jensen of the Copperweld Steel Company outlined the advantages of deep driven grounds, citing examples of their effectiveness in improving operating performance, describing methods of installation, and presenting data from tests on grounds in various parts of the country.

W. R. Bullard summarized the results of a survey of overhead transmission lines in urban areas. Most companies using single wood pole structures for lines along city streets have had little trouble with them, and plan to continue such installations.

A series of presentations dealt with preservative treatment of standing poles. J. G. Charest described a successful program of ground line treatment of chest-

nut poles which utilizes a plastic compound consisting of sodium fluoride, dinetrophenol, and potassium dichromate in a vehicle of coal tar and creosote. J. H. Milbyer described a similarly successful program of ground line treatment of all untreated poles in his area. G. L. Wilkins described a recently initiated program of above ground treatment of existing cedar poles already having a satisfactory ground line treatment. A 5 per cent solution of pentachlorophenol in light fuel oil is flowed into the pole from a special head mounted at the end of a plastic tube.

W. C. Phillips presented a preliminary report on the AIEE-EEI survey of outages on transmission lines 100 kv and above. Lightning was the chief cause for about two-thirds of outages, with higher voltage lines showing a decreasing outage rate for lightning as well as other causes. 91 per cent of all faults were temporary, although the majority of these produced secondary effects. The final report is to be published as an AIEE paper.

C. W. Jones of the Defense Electric Power Administration explained the objectives of DEPA and answered questions on problems associated with the government control of materials.

Round table discussion covered many subjects. Numerous problems in switching pole type capacitors were indicated and various methods of control were described. Discussion revealed a divided opinion regarding the relative merits of plank and spar arms for H-frame construction.

The desirability of converting 2.4 kv circuits to 4 kv versus conversion all the way to 12 kv was the subject of lengthy discussion. Present load densities or those anticipated in the near future are pointing to the need for 12 kv systems in many areas, but this voltage level introduces new problems, such as greater clearances, better tree trimming, and additional protection and training for linemen maintaining these circuits.

Hydraulic Power Committee Meeting

G. J. Vencill, *Chairman*

MEMBERS of the Hydraulic Power Committee were guests of the Aluminum Co. of America at Tapoco Lodge in the Great Smoky Mountains of North Carolina on the occasion of the Committee's recent annual meeting. On May 3 members and guests convened for the business sessions of the conference. In the evening motion pictures were presented by the hosts. The following day was devoted to inspecting three hydro stations near Tapoco.

The discussions at the meetings centered around current hydraulic plant problems and the activities and reports of subcommittees. Chairman Vencill presided.

P. M. Hess reviewed an interesting study advanced by the Pennsylvania Water and Power Co. to predict ice movements and summarized the severe movements which took place in the Susquehanna River during the past winter. In addition, numerous new ideas and schemes were explained, which the company has been utilizing in the hope of preventing and alleviating the effect of ice jams. Aerial motion pictures were shown to assist in the study of ice formations and their resultant jamming at various points in the river. The purpose of this study is to develop methods to detect and prevent, if possible, the formation of frazil ice or to quickly convert it to sheet ice by artificial "seeding." Other studies carried out by the company include the use of many heat absorbing materials which will contribute to accelerated disintegration of sheet ice.

Cavitation Subcommittee

R. R. Randolph, representing N. F. Williams, chairman of the Cavitation Subcommittee, presented an interim report entitled "Pitting Experience of Hydraulic Turbines." This paper, concerning pitting encountered on Francis and propeller type hydraulic turbines, summarized information collected from more than fifty hydro plant operating organizations. Sufficient data on conditions and dimensions of the turbines and settings has been obtained to correlate the pitting action with specific speed, horsepower, and plant sigma, or some other physical characteristics. The report was noteworthy in that it represents experience on a total of approximately 660 turbines, qualitatively relating this problem to factors under the control of the hydraulic engineer. The Subcommittee was asked to continue its study with the object of submitting a final report next year.

During the discussion of the pitting of turbine runners, attention was called by several Committee members and guests to the fact that pitting areas that had been hard-surfaced by the application of a sprayed stainless steel alloy successfully resisted the effects of cavitation, if the overlay section was not reshaped by grinding. Where the sprayed areas had been ground, pitting had occurred during subsequent operation, while unground sections of stainless steel were not attacked during the same running period.

The Automatic Control Subcommittee's report on "Automatic Hydro Plants" was presented by Hibbert Hill, chairman of that group. One of the primary problems confronting the hydraulic plant operating organization is the degree to which a station should be automatized. This consideration has currently been emphasized by the difficulty of procuring proficient operating personnel. The Subcommittee's report summarized executed questionnaires from several hydraulic generating companies, indicating the present status of automatization together with a compilation of operating and conversion cost data and comments received from contributing organizations. Mr. Hill's group made no attempt to draw conclusions from their study, since the factors involved in considering the economics of automatization are varied in each case. Mr. Hill stated, however, that the present trend in hydraulic power stations is toward semi-automatic plants. The preparation of the report concludes the objectives for which the Subcommittee was organized. With an expression of appreciation from the Committee chairman, the group was disbanded.

An informative general discussion was held on plant security. This subject has recently received extensive consideration by the companies of many of the Committee members. The discussion indicated that the policing and security measures deemed necessary by public utility hydro plants at the present time must be provided by the individual organization. Seven of the nine utility plants represented at the meeting have been closed to the public, while two are still open to visitors. Protective measures employed or proposed at different stations were presented.

A report of the Artificial Precipitation Subcommittee was presented by Roger D. Ley in the absence of the chairman, P. H. Yelton. Rain making methods have been practiced in several sections of the country to such an extent that reports are now available on the effectiveness of this highly controversial process. The Subcommittee's report consisted primarily of several articles detailing procedures and apparent results of cloud seeding. Several of the reports claim noteworthy success from the operations. The Subcommittee will continue its activity of analyzing future experiences and developments in this field.

The problem of protective coatings for underwater metals was discussed. Two methods were refered to that have proven successful. P. M. Lefever described zinc protection used on underwater gates at the Conowingo Dam. Thin zinc strips were mounted on the gate surface with a clamping device that caused the strips to be retained securely against the gate as deterioration occurs. P. M. Hess stated that the underwater coating used at the Safe Harbor Dam has to date given eleven years of satisfactory service. The method employed at this dam consists of sandblasting all surfaces, zinc spraying of rivet heads, applying inhibitor to entire surface, brush coating the rivet heads and applying three coats of either zinc dust, zinc oxide paint, or modified red lead by spraying.

Concrete repairs that have been effected by "guniting" were described by several members. This method of refacing dams was referred to as very successful. One report indicated that gunite applied in 1939 shows no signs of deterioration at the present time.

The Committee members and guests discussed the governing of turbines in relation to interconnected system operation. Different methods were described as being suitable for different systems, depending on, among other factors, the machine load and the governing system interconnections.

The final discussion of the meeting concerned the problem of fish protection in streams and rivers utilized for the generation of electricity. Attention was directed to the fact that this matter is deterring the construction of many possible hydro stations. The operation of fish ladders was considered, with details of certain installations being noted. Mention was also made that an electrical repulsion method is successfully being used to direct fish.

The Job Is the Thing

(*Continued from page* 171)

management needing those who are watching the trend and observing what is going on throughout the country.

It is therefore important to all of us that the advertising and public information man not only sharpen his ability to do the job he is charged with doing, but that he try to devise gauges whereby its effectiveness may be demonstrated. Such gauges will help the gospel penetrate his own organization and more thoroughly enlist support for his efforts, which, of course, should be laid upon us all.

Because the attack on us so often is carried on the backs of innuendo and half truths, we have been provided with some simple but great weapons of defense. Most fundamental, of course, is the efficient and honorable operation of a sound and vital industry. The other, let me repeat again and again, is telling our story, telling it truthfully, in effective, hard-hitting, and convincing terms. Neither weapon is effective without the other. . . . You cannot tell a story if it is not true, and no matter how good a story you have, it is no good unless it is told.

Herein is our dependence upon you. We think we have, can, and will provide you with a good story. It is up to this section of the industry to tell it appealingly, effectively, everlastingly, and truthfully.

I am as confident that our cause will prevail as I am of your ability to do that job.

The Electrical Industry Looks at 1951

(*Continued from page* 191)

Time will permit the answer to only one more question. Will we need better selling in 1951? You know that I believe the answer to that question is yes. There is evidence now that inventories are increasing rapidly at the distributor and dealer levels. It is selling, and only creative selling, that can save us from a repetition of our experience in the spring of 1949.

I think we would do well, both for ourselves and for the national economy, to look upon 1951 as a buyer's year rather than a seller's year. I say "for the national economy" because, after all, it is mass production of civilian goods that must finance much of our mobilization and there can be no mass production of goods without mass production of customers.

Moreover, there's another reason why both you and we need mass production of customers right now. That's because our break-even point is rising, and our margin of safety is getting thinner.

Production people and engineers can do only so much to reduce expenses in these times. What's more, price increases aren't the whole answer because none of us can afford to price ourselves out of the market. The only way left is to increase volume. The solution to the problem of high wages, hold-the-line-on-prices, and still get adequate profits is through the creation of more customers.

This takes selling. I know you gentlemen have other problems besides sales problems. But I wonder if the real objective of everything you do, or I do, isn't selling. Whether it's financing the expansion of new facilities, whether it's public relations, or legal matters, or engineering problems, isn't our end objective one of selling more of what we make? And both of us together are selling the greatest, most tangible thing of all—electrical living for everybody.

What's more, Americans are enamoured with the idea of electrical living. We like leisure, comfort, and convenience. We love to push buttons and watch lights go on, or toast pop up, and washers spin. We all want electrical living. All America wants electrical living.

This, then, is our goal. Electrical living for everybody. It is born of the belief that Americans, whoever they are, wherever they are, are entitled to the better life that comes from living electrically. It asks the best in leadership from all of us in the industry. And as leaders, we must make our objective known.

In another difficult period in world history, St. Paul had this to say about leadership: "For if the trumpet give forth an uncertain sound, who shall prepare himself for battle."

PERSONALS

THEODORE A. SCHLINK, vice president and comptroller, Central Illinois Light Co., has been named president of the company, succeeding J. A. LONGLEY, who has been elected chairman of the board.

MR. SCHLINK

The company has also appointed three new vice presidents: ROY K. DALLAS, service sales manager; EARL D. EDWARDS, general superintendent of the electric department; and GEORGE W. HATHWAY, manager of the De Kalb division.

In other changes R. N. WHITE, secretary, was elected comptroller; A. W. EGGER, assistant secretary, was named assistant comptroller; and ERNEST W. STONE, electric distribution engineer, was made manager of the company's De Kalb-Sycamore division.

Mr. Schlink entered the utility business in 1904 as a messenger boy for the Peoria Gas and Electric Co. and during the next nine years worked in the general office, storeroom, and commercial office. When the Central Illinois Light Co. was formed in 1913, he became treasurer and in 1927 was named secretary. In 1938 he was appointed vice president and comptroller.

After service with the West Liberty Light and Power Co. and the Ohio Edison Co., Mr. Dallas joined Central Illinois in 1927 as a power sales engineer in the De Kalb division. He was later named division manager and in 1940 transferred to the Peoria division, becoming service sales manager for all divisions. He will now head all commercial activities.

W. W. BABCOCK, formerly superintendent of power, will assist Mr. Dallas in his new post. Q. W. WELLINGTON, construction engineer, will succeed Mr. Babcock.

Mr. Edwards became associated with Illinois Central in 1923 as chief engineer of the Pekin district and a year later went to the company's generating plant in East Peoria as chief engineer. In 1929 Mr. Edwards joined the Commonwealth and Southern System as supervising engineer but returned to Illinois Central two years later as operating mechanical engineer. In 1941 he was named electric superintendent. As vice president he will head all of the company's electric and heating operations.

Mr. Hathway started his utility career with the Western United Gas and Electric Co. in 1931 and the following year joined Central Illinois. After working in the gas service and the service sales departments, he was appointed manager of the De Kalb division, which position he held from 1946 until his promotion to vice president.

JAMES A. COOK has been elected president of the Lynn (Mass.) Gas and Electric Co. to succeed H. MORRIS KELLY, who has been named chairman of the board.

Mr. Cook began his career as an apprentice at the Sprague Works of General Electric Co. He was later associated with the Cleveland Construction and Warren Bicknell Companies in Cleveland and with the engineering staff of D. C. and William B. Jackson in Chicago.

He served with the New York Edison Co. as assistant superintendent of the test department and as assistant engineer of the distribution and installation department.

In 1925 Mr. Cook joined Lynn Gas and Electric as general superintendent of the electrical department. He advanced to the position of general manager in 1934 and vice president in 1947. In his new position he will continue to serve as general manager.

E. H. COTTON, vice president in charge of operation, Northern States Power Co., has been elected president of the Wisconsin Utilities Association, succeeding ALFRED GRUHL, Wisconsin Electric Power Co.

THERON BROWN, vice president and general superintendent, Madison Gas and Electric Co., was elected vice president, succeeding Mr. Cotton, and IRVING P. STEYBE, assistant secretary and assistant treasurer, Wisconsin Public Service Corp., was re-elected treasurer.

Mr. Cotton, a graduate of the University of Minnesota, entered the utility industry in 1919 as a cadet engineer of the St. Paul Gas Light Co. Following promotions to key posts in the operation divisions of the Northern States Power Co., which purchased St. Paul Gas Light, he was transferred to Wisconsin in 1927.

MR. COOK

CHARLES E. NEIL has been appointed assistant to the president of the North American Co., Herbert C. Freeman, president, has announecd.

Mr. Neil was born in Medina, Ohio, in 1889, son of Charles D. and Nellie S. Neil, publishers and editors of the *Medina County Gazette*. In 1899 his family moved to Denver, Colo., where he received his public school education.

In 1914 after several years' service with western railways, he was appointed rate expert of the newly created Public Utilities Commission of Colorado and in such connection participated in committee activities of the National Association of Railroad and Utilities Commissioners.

From 1920 to 1924 Mr. Neil was editor of publications for the National Electric Light Association, predecessor of the Edison Electric Institute. Publica-

tions under his supervision included the BULLETIN and the annual proceedings and rate book. During that period he was also editor of the weekly magazine, *Rate Research,* which reported on current public utility law and decisions by public service commissions and the courts in utility regulatory matters.

In 1924 he joined The North American Co. as assistant to the vice president and general manager. In 1933 he was appointed assistant to the president, and held that post through 1935.

In 1935 he became associated with the electric and gas operating subsidiaries of The North American Co., including the Union Electric Co. of Missouri, The Cleveland Electric Illuminating Co., Wisconsin Electric Power Co., Illinois Power Co., and Kansas Power and Light Co. In 1941 he returned to The North American Co. offices, as rate specialist and representative to utility organizations.

He has contributed numerous papers to electric trade associations and articles to trade journals of the railroad, electric, gas, and transit industries, and for many years has been a member of the EEI rate research committee.

He is a director of Central-Illinois Securities Corporation.

EDITOR'S ADDENDA: Ted Neil is also an erudite bibliophile, a musicologist of distinction, and co-author of a classic *Report of Report Reading Committee* (1922), which unfortunately is out of print, but a few copies are still circulating in the underground system.

SAMUEL M. HAMILL, JR., electric operating department manager, The Cincinnati Gas and Electric Co., has been elected a vice president of the company. In his new position, Mr. Hamill will supervise the company's electrical department, which includes both distribution and operating departments.

Joining Cincinnati Gas and Electric in 1923 as a substation operator, he served as maintenance electrician, test electrician, and chief test engineer before becoming assistant superintendent of the electric operating department in 1930. He was advanced to superintendent in 1946 and was named manager two years later.

CALVIN T. HUGHES, vice president in charge of operation, The Connecticut Light and Power Co., has been assigned as vice president in charge of the company's new engineering department which will be responsible for all engineering activities. WALTER W. FORMAN, formerly general superintendent of operation, has been named a vice president to succeed Mr. Hughes.

An electrical engineering graduate of the University of Oklahoma and a postgraduate student at Yale University, Mr. Hughes has been with The Connecticut Light and Power Co. since leaving the Signal Corps at the end of World War I. He joined the company originally as a cadet engineer and held successively the positions of assistant, electrical, and general engineer before becoming general superintendent in 1939. He was elected operating vice president in December, 1949.

Mr. Forman is a graduate of Stevens Institute of Technology. He entered the public utility field in 1923 with the Adirondack Power and Light Co. and later became associated with W. A. Shoudy, New York utility construction engineers. He joined The Connecticut Light and Power in 1929 as general engineer. In 1943 he was appointed assistant general superintendent and became general superintendent in December 1949.

New Officers and Contest Winners Announced at PUAA Convention

JOHN E. CANFIELD, director of public information, Wisconsin Power and Light Co., was elected president of the Public Utilities Advertising Association at the Association's 30th annual convention at the Hotel New Yorker. Mr. Canfield succeeds William B. Hewson, assistant vice president, Brooklyn Union Gas Co.

Other new officers elected were Paul L. Penfield, Detroit Edison Co., first vice president; Walter G. Heren, Union Electric Co. of Missouri, second vice president; C. Fred Westin, Public Service Electric and Gas Co., third vice president; George G. Hanel, The Connecticut Light and Power Co., secretary; Mead Schenck, Interstate Power Co., treasurer.

A feature of the convention was the announcement of 143 winners of the 1951 Better Copy Contest. This, the contest's 28th straight year, is said to be a record for competition in the advertising profession. Entries were judged in 22 classes which included virtually every media of advertising and public information.

Members of the contest committee voted a special citation to the Potomac Electric Co., for its cartoon advertisement, "Ten Little Free Workers," which pointed out the dangers to all industries of socialism. Since the advertisement first appeared, it has been reprinted by scores of other public utility companies and by many other industrial concerns and associations.

Prominent among the speakers at the convention were L. V. Sutton, president of the Edison Electric Institute and the Carolina Power and Light Co., and D. A. Hulcy, president of the American Gas Association, the U. S. Chamber of Commerce, and the Lone Star Gas Co.

Mr. Sutton's remarks appear elsewhere in this issue of the BULLETIN. Discussing rival gas and electric advertising, Mr. Hulcy called upon utility executives to keep advertising competitive but clean. "Let's advertise our services and our appliances on their merits and not at the expense of the other fellow," he said.

Dr. Claude Robinson of Opinion Research, Inc., spoke of the role played by research in advertising, while Marion Harper, president of McCann-Erickson, Inc., described various research techniques. Denny Griswold, publisher of *Public Relations News,* said that public utilities were often to be commended for their industrial and stockholder relations but were poor in their press relations. Tom P. Walker, vice president, Irving Trust Company of New York, spoke of the necessary cultivating of good relations with stockholders.

Other speakers included Dr. James W. Fifield, of Los Angeles, founder of Spiritual Mobilization, and Tex McCrary and Jinx Falkenberg, radio and televison personalities.

At Radio City, delegates attended a demonstration of television techniques and heard a discussion of the role television does and might play in public utility advertising. Among the exhibits, staged by National Broadcasting Co., were re-enactments of television programs now being sponsored by utilities.

The *Better Copy Awards Book,* reproducing all winning entries, is available from C. Fred Westin, Public Service Electric and Gas Co., Newark 1, N. J. Single copies are $10.00.

CONVENTIONS AND MEETINGS

1951

JUNE

4 EEI Industrial Relations Committee, Denver, Colo.
4-7 EDISON ELECTRIC INSTITUTE, Nineteenth Annual Convention, Denver, Colo.
11-15 ASME Semi-Annual Meeting, Royal York Hotel, Toronto, Ontario.
13-16 ASCE Summer Meeting, Louisville, Ky.
14 Illuminating Engineering Society, National Council, New York, N. Y.
14-15 Northwest Electric Light & Power Association, Accounting Meeting, Boise Hotel, Boise, Ida.
15 PIP Mid-Atlantic Group, Safe Harbor, Pa.
18-19 International Association of Electrical Inspectors, 18th Meeting of Virginia Chapter, Monticello Hotel, Charlottesville, Va.
18-21 Canadian Electrical Association, Annual Convention, Algonquin Hotel, St. Andrews, New Brunswick.
20-21 EEI Commercial Lighting Committee, Detroit, Mich.
22 PIP Steering Committee, Stevens Hotel, Chicago, Ill.
22-23 ASME West Coast Applied Mechanics Conference, Stanford University, Calif.
24-27 Michigan Electric Light Association Annual Convention, Mackinac Island, Mich.
25-29 ASME Oil and Gas Power Division Conference, Baker Hotel, Dallas, Tex.
25-29 AIEE Summer General Meeting, Royal York Hotel, Toronto, Ontario.

JULY

2-4 American Society of Heating & Ventilating Engineers, Semi-Annual Meeting, Portland, Ore.
11 ECAP Management Group, Blackstone Hotel, Chicago, Ill.
12 PIP East North Central Group, Detroit, Mich.

AUGUST

20-23 American Institute Electrical Engineers, Pacific General Meeting, Multnomah Hotel, Portland, Ore.
27-30 Illuminating Engineering Society, National Technical Conference, Hotel Shoreham, Washington, D. C.

SEPTEMBER

9-12 Rocky Mountain Electrical League Fall Convention, La Fonda Hotel, Santa Fe, N. M.
10-11 EEI Commercial Cooking Committee, EEI Headquarters, 420 Lexington Ave., New York, N. Y.
10-14 Joint ASME Industrial Instruments & Regulators Division, and Instrument Society of America, Exhibit and Conference, Houston, Texas.
13-15 International Association of Electrical Inspectors, Southwestern Section, Hotel Lafayette, Long Beach, Calif.
19 EEI Legal Committee, EEI Headquarters, 420 Lexington Ave., New York, N. Y.
19-21 International Association of Electrical Inspectors, Northwestern Section, Hotel Davenport, Spokane, Wash.
20-21 PIP Second Annual Workshop Conference, Edgewater Beach Hotel, Chicago, Ill.
20-21 Wisconsin Utilities Association, Accounting Section, Plankinton Hotel, Milwaukee, Wis.
21 Oklahoma Utilities Association, Gas Division, Biltmore Hotel, Oklahoma City, Okla.
21-22 Public Utilities Association of the Virginias, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.
24-26 ASME Petroleum Mechanical Engineering Conference, Hotel Mayo, Tulsa, Okla.
25-27 International Association of Electrical Inspectors, Western Section, Hotel Fontenelle, Omaha, Neb.
25-28 ASME Fall Meeting, Hotel Radisson, Minneapolis, Minn.

OCTOBER

1-2 EEI Prime Movers Committee, Statler Hotel, Buffalo, N. Y.
1-2 Iowa Utilities Association, Management Conference, Fort Des Moines Hotel, Des Moines, Ia.
1-3 EEI Meter and Service Committee, Purdue University, Lafayette, Ind.
1-3 International Association of Electrical Inspectors, Eastern Section, Hotel Claridge, Atlantic City, N. J.
1-3 International Association of Electrical Inspectors, Eastern Section, Chalfonte-Haddon Hall, Atlantic City, N. J.
8-9 EEI Electrical Equipment Committee, New Ocean House, Swampscott, Mass.
8-12 39th National Safety Congress and Exposition of National Safety Council, Chicago, Ill.
9-10 National Farm Electrification Conference, Gibson Hotel, Cincinnati, Ohio.
9-10 National Farm Electrification Conference, Gibson Hotel, Cincinnati, Ohio.
10-11 Transmission and Distribution Committee, Sheraton Hotel, Rochester, N. Y.
10-12 Indiana Electric Association Annual Convention, French Lick Springs Hotel, French Lick, Ind.
11-12 ASME Fuels—AIME Coal Conference, Roanoke, Va.
15-17 International Association of Electrical Inspectors, Southern Section, Hotel John Marshall, Richmond, Va.
15-17 American Gas Association Annual Convention, Kiel Auditorium, St. Louis, Mo.
16-19 National Association of Railroad and Utilities Commissioners, Francis Marion Hotel, Charleston, S. C. (Executive Meeting, Oct. 15).
22 Oklahoma Utilities Association, Electric Light and Power Division, Western District, Lake Murray Lodge, Ardmore, Okla.
22-24 American Standards Association, 33rd Annual Meeting, Waldorf Astoria, New York, N. Y.
22-25 ASCE New York Convention, New York, N. Y.
22-26 AIEE Fall General Meeting, Hotel Cleveland, Cleveland, Ohio.
24 Oklahoma Utilities Association, Electric Light and Power Division, Eastern District, Aldridge Hotel, McAlester, Okla.
31-NOV. 2 Southeastern Electric Exchange Annual Sales Conference, Roosevelt Hotel, New Orleans, La.

NOVEMBER

12-15 NEMA, Haddon Hall, Atlantic City, N. J.
14-16 Wisconsin Utilities Association, Electric and Gas Sections, Sales and Engineering Divisions, Schroeder Hotel, Milwaukee, Wis.
25-30 ASME Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.
29-30 Pacific Coast Electrical Association, 2nd Annual Hawaiian Conference, Royal Hawaiian Hotel, Honolulu, T. H.

DECEMBER

20 Electrical and Gas Association of N. Y., Inc., Christmas Luncheon, Grand Ballroom, Hotel Astor, New York, N. Y.

1952

MARCH

3-7 American Society of Civil Engineers, New Orleans Convention, New Orleans, La.
10-13 National Electrical Manufacturers Association, Edgewater Beach Hotel, Chicago, Ill.
27-28 Oklahoma Utilities Association Convention, Biltmore Hotel, Oklahoma City, Okla.

APRIL

8-10 Oklahoma Utilities Association, Southwestern Gas Measurement Short Course, North Campus, University of Oklahoma, Norman, Okla.

JUNE

16-20 American Society of Civil Engineers, Denver Convention, Denver, Colo.

JULY

18 EEI Industrial Relations Committee, EEI Headquarters, 420 Lexington Avenue, New York, N. Y.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

OFFICERS

L. V. SUTTON, *President*.....Carolina Power and Light Co., Raleigh, N. C.
H. B. BRYANS, *Vice President*.....Philadelphia Electric Co., Philadelphia, Pa.
H. S. BENNION, *Vice President and Managing Director*...420 Lexington Avenue, New York, N. Y.
K. B. CRUMB, *Treasurer*.....American Gas & Electric Service Corp., New York, N. Y.
MAE B. WOODS, *Secretary*.....420 Lexington Avenue, New York, N. Y.

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(Terms Expiring 1951)

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HAROLD QUINTON .....Southern California Edison Co., Los Angeles, Cal.
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(Terms Expiring 1952)

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FRANK M. WILKES..... Southwestern Gas & Electric Co., Shreveport, La.

(Terms Expiring 1953)

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E. W. DOEBLER.....Long Island Lighting Co., Mineola, N. Y.
M. F. GILL.....Kansas Gas and Electric Co., Wichita, Kan.
N. B. GUSSETT.....Iowa Power and Light Co., Des Moines, Iowa
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R. H. KNOWLTON.....The Connecticut Light and Power Co., Hartford, Conn.
E. L. LINDSETH.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
H. E. MEADE.....New Orleans Public Service Inc., New Orleans, La.
J. W. PARKER.....The Detroit Edison Co., Detroit, Mich.
H. T. PRITCHARD.....Indianapolis Power and Light Co., Indianapolis, Ind.
K. M. ROBINSON.....The Washington Water Power Co., Spokane, Wash.
L. V. SUTTON.....Carolina Power and Light Co., Raleigh, N. C.
H. C. THUERK.....New Jersey Power and Light Co., Dover, N. J.

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EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

(Continued)

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PRENTISS BROWN..The Detroit Edison Co., Detroit, Mich.
CURTIS E. CALDER.....Electric Bond & Share Co., New York, N. Y.
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WILLIAM SCHMIDT, JR., Consolidated Gas Electric Light & Power Co., Baltimore, Md.
PHILIP SPORN...American Gas & Electric Service Corp., New York, N. Y.
E. S. THOMPSON.....The West Penn Electric Co., Inc., New York, N. Y.
J. V. TONER.....Boston Edison Co., Boston, Mass.
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E. A. YATES...The Southern Co., Inc., New York, N. Y.

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Customer Accounting, M. J. WALSH.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
Customer Collections, F. J. FLOM..... The Detroit Edison Co., Detroit, Mich.
Customer Relations, E. G. PRENTICE .....NEGEA Service Corp., Cambridge, Mass.
Depreciation Accounting, ALEX. E. BAUHAN.....Public Service Electric & Gas Co., Newark, N. J.
General Accounting, L. C. PROVENCHER.....The Detroit Edison Co., Detroit, Mich.
Internal Auditing, H. R. SYMES.....The Detroit Edison Co., Detroit, Mich.
Plant Accounting and Records, C. E. RAINES.....Niagara Mohawk Power Corp., Albany, N. Y.
Taxation Accounting, CHARLES WIGAND.....Commonwealth Services, Inc., New York, N. Y.

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Commercial Division General, M. E. SKINNER.....Union Electric Co. of Missouri, St. Louis, Mo.
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Commercial Sales Section, C. D. HOLLISTER.....Niagara Mohawk Power Corp., Albany, N. Y.
Farm Section, R. T. JONES.....Pennsylvania Power and Light Co., Allentown, Pa.
Industrial Power and Heating Section, ROBERT G. ELY.....The Connecticut Light and Power Co., Hartford, Conn.
Residential Section, E. O. GEORGE.....The Detroit Edison Co., Detroit, Mich.

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Electrical Equipment, J. H. FOOTE.....Commonwealth Associates, Inc., Jackson, Mich.
Hydraulic Power, G. J. VENCILL.....Union Electric Co. of Missouri, St. Louis, Mo.
Meter and Service, H. A. BROWN.....Rochester Gas & Electric Corp., Rochester, N. Y.
Prime Movers, F. P. FAIRCHILD.....Public Service Electric & Gas Co., Newark, N. J.
Transmission and Distribution, J. E. MCCORMACK.....Consolidated Edison Co. of New York, Inc., New York, N. Y.

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Codes and Standards, D. C. LUCE.....Public Service Electric & Gas Co., Newark, N. J.
Electric Power Survey, WALKER L. CISLER.....The Detroit Edison Co., Detroit, Mich.
Financing and Investor Relations, C. E. OAKES.....Pennsylvania Power and Light Co., Allentown, Pa.
Industrial Relations, S. F. LEAHY.....The Detroit Edison Co., Detroit, Mich.
Insurance, I. M. CARPENTER.....Ebasco Services Inc., New York, N. Y.
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Membership, E. S. THOMPSON.....The West Penn Electric Co., Inc., New York, N. Y.
Prize Awards, G. E. WHITWELL.....Philadelphia Electric Co., Philadelphia, Pa.
Purchasing and Stores, H. E. HODGSON.....Wisconsin Power & Light Co., Madison, Wis.
Rate Research, HARRY I. MILLER.....Wisconsin Public Service Corp., Oshkosh, Wis.
Rural and Urban Development, G. R. KEEGAN.....Western Massachusetts Electric Co., Springfield, Mass.
Statistical, ELDRED H. SCOTT.....The Detroit Edison Co., Detroit, Mich.
Transportation, S. G. PAGE.....Duquesne Light Co., Pittsburgh, Pa.

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